Philips Consumer Electronics

Technical Service Data

Service and Quality
Service Publications Dept.
One Philips Drive
P.O. Box 14810
Knoxville, TN 37914

Manual 7583
Model no.: 26LL590121
First Publish: 10-9-2000
Rev. Date: 08-02-2004
Print Date: 10/07/2006

Pg. SCHEMATIC DIAGRAMS AND PC BOARDS

REFER TO SAFETY GUIDELINES

SAFETY NOTICE: ANY PERSON ATTEMPTING TO SERVICE THIS CHASSIS MUST FAMILIARIZE HIMSELF WITH THE CHASSIS AND BE AWARE OF THE NECESSARY SAFETY PRECAUTIONS TO BE USED WHEN SERVICING ELECTRONIC EQUIPMENT CONTAINING HIGH VOLTAGES.

CAUTION: USE A SEPARATE ISOLATION TRANSFORMER FOR THIS UNIT WHEN SERVICING

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Mechanical Assembly

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DISASSEMBLY INTRODUCTIONS

(Display Cabinet Back Removal Illustration)

(Display Main Chassis Removal Illustration)

(Display Service Position Illustration)

DISASSEMBLY PROCEDURE

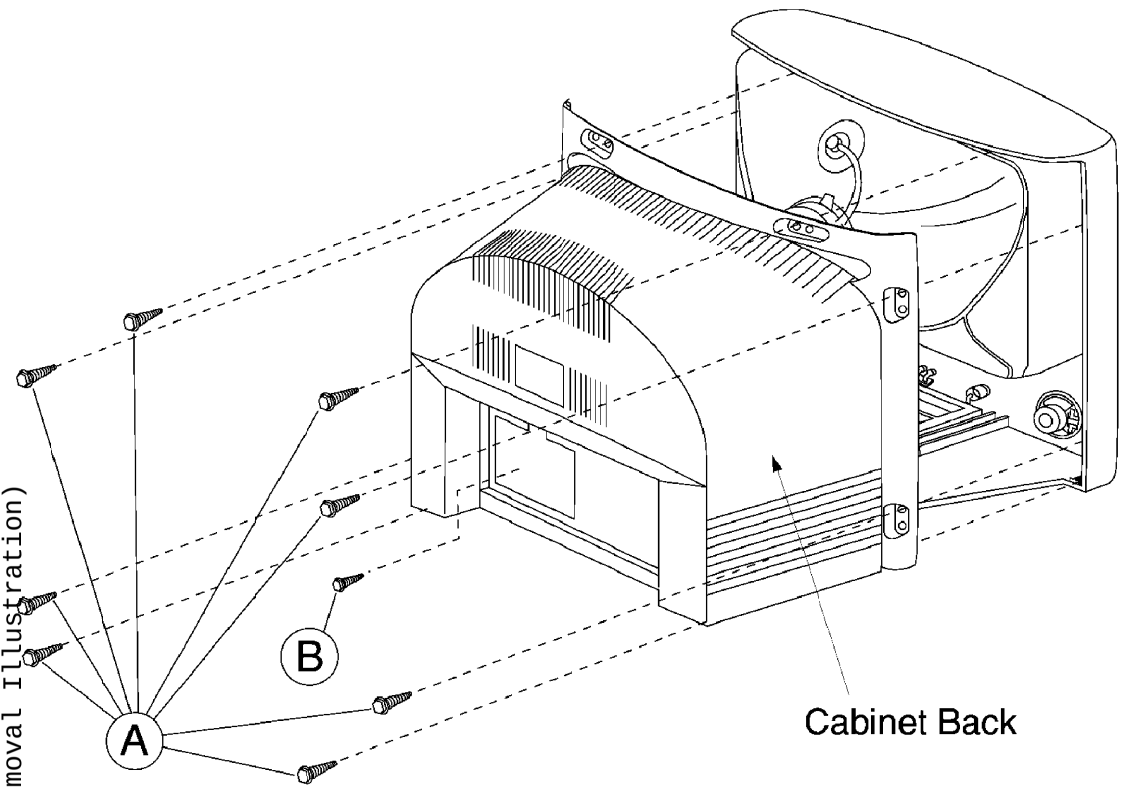


ILLUSTRATION 1
Cabinet Back

Step 1 Remove eight 1/4 inch screws (A).
Step 2 Remove one 3/16 inch screw (B). (Number of screws depends on Jack Panel)
Step 3 Remove Cabinet Back.

(Display Cabinet Back Removal Illustration)

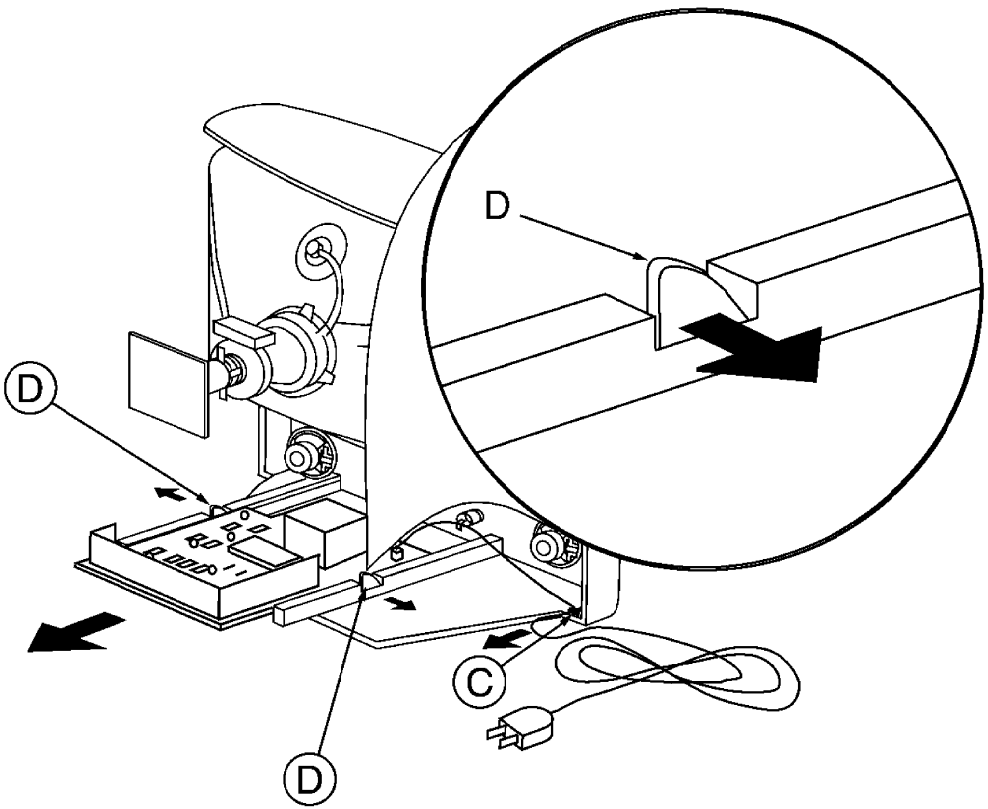
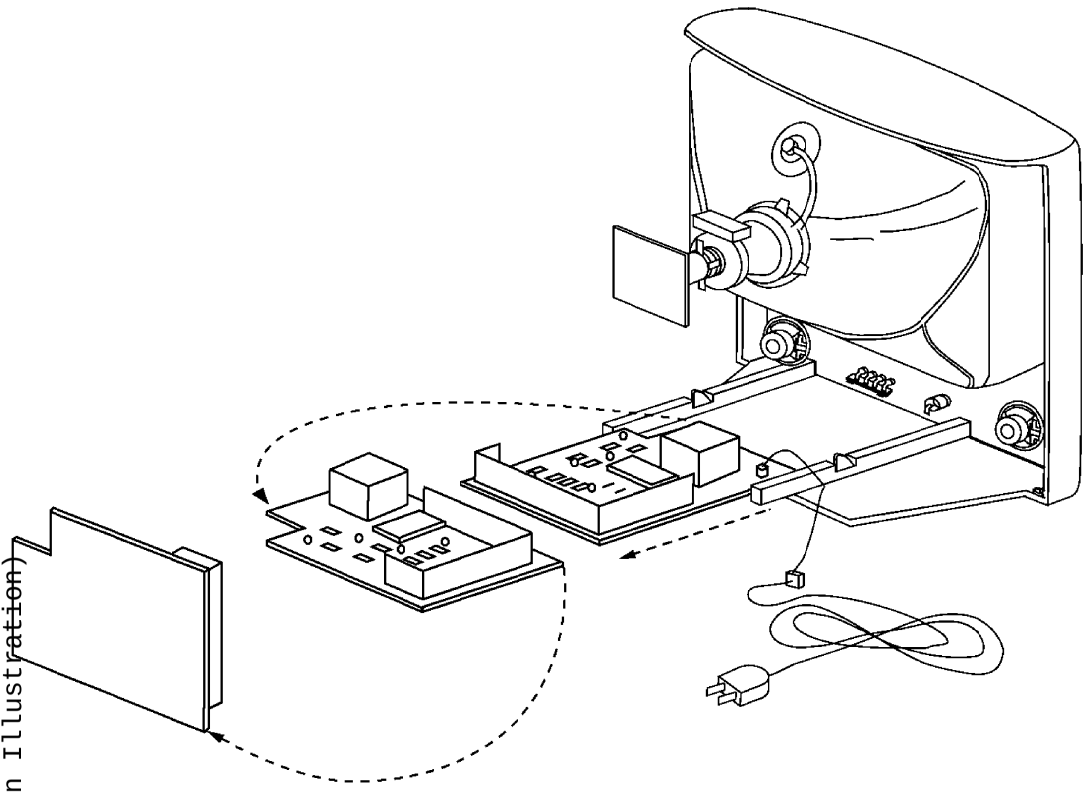


ILLUSTRATION 2
Main Chassis

Step 4 Remove AC Power Cord from Cabinet Front, by sliding tension bushing out of slot. (C)

Step 5 Release Main Chassis by pulling two tabs (D) out away from chassis.

(Display Main Chassis Removal Illustration)



(Display Service Position Illustration)

ILLUSTRATION 3
SERVICE POSITION

Step 6 Slide Chassis back out of unit.
Step 7 Rotate Chassis counter clockwise 1/4 turn.
Step 8 Position Chassis on its side.

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Mechanical Diagrams

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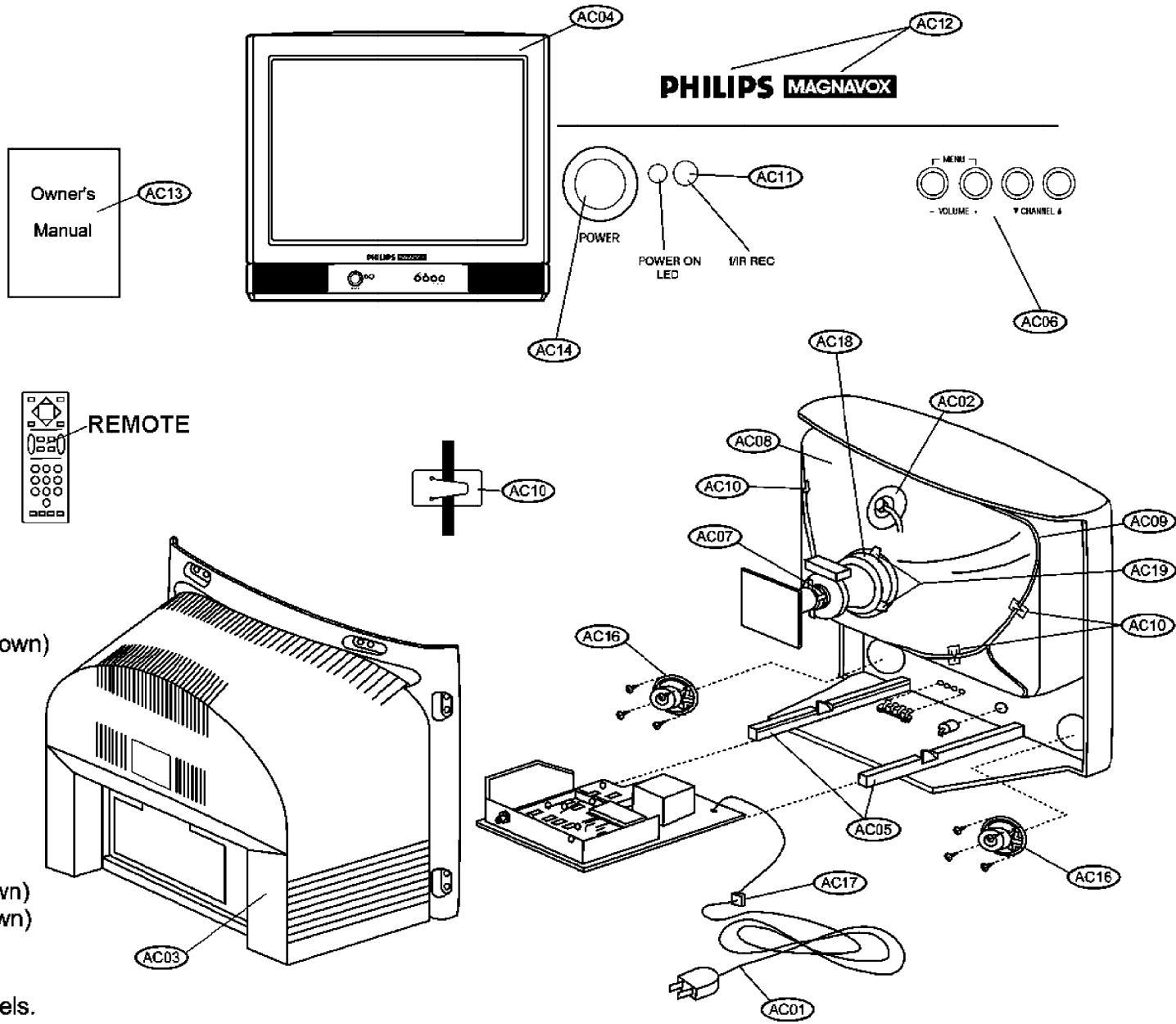
CAUTION: USE A SEPARATE ISOLATION TRANSFORMER FOR THIS UNIT WHEN SERVICING

TYPICAL TABLE MODEL EXPLODED VIEW

REF.		DESCRIPTION
AC01	⚠	AC Power Cord
AC02	⚠	Anode Clip
AC03		Cabinet Back
AC04		Cabinet Front
AC05		Chassis Guide
AC06		Control Buttons
AC07	⚠	Convergence and Purity Assembly
AC08	⚠	CRT
AC09	⚠	Degaussing Coil
AC10		Degaussing Coil Holder (4 Used)
AC11		Light Guide
AC12		Nameplate
AC13		Owner's Manual
AC14		Power Button
REMOTE		Remote Transmitter
AC16		Speaker
AC17		Strain Relief for AC Cord
AC18	⚠	Yoke
AC19		Yoke Wedge
AC20		AC Adaptor (Not Shown)
AC21		Batteries for Remote Transmitter (Not Shown)
AC22		Card Door Cover (Not Shown)
AC23		Card Housing (Not Shown)
AC24		Degaussing Coil Spring (Not Shown)
AC25		Instruction Sheet (Not Shown)
AC26		Jack Panel, Plastic (Not Shown)
AC27		OCV Card Door Cover (Not Shown)
AC28		RF Cable (Not Shown)
AC29		Vent Cover (Not Shown)
AC30		**Extra Power Supply Bracket** (Not Shown)
AC31		**Extra Power Supply Module** (Not Shown)
AC32		Scan Card Cover
AC33		Jack Panel, Plastic

Note: Some parts listed are not available in all models.



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Troubleshooting

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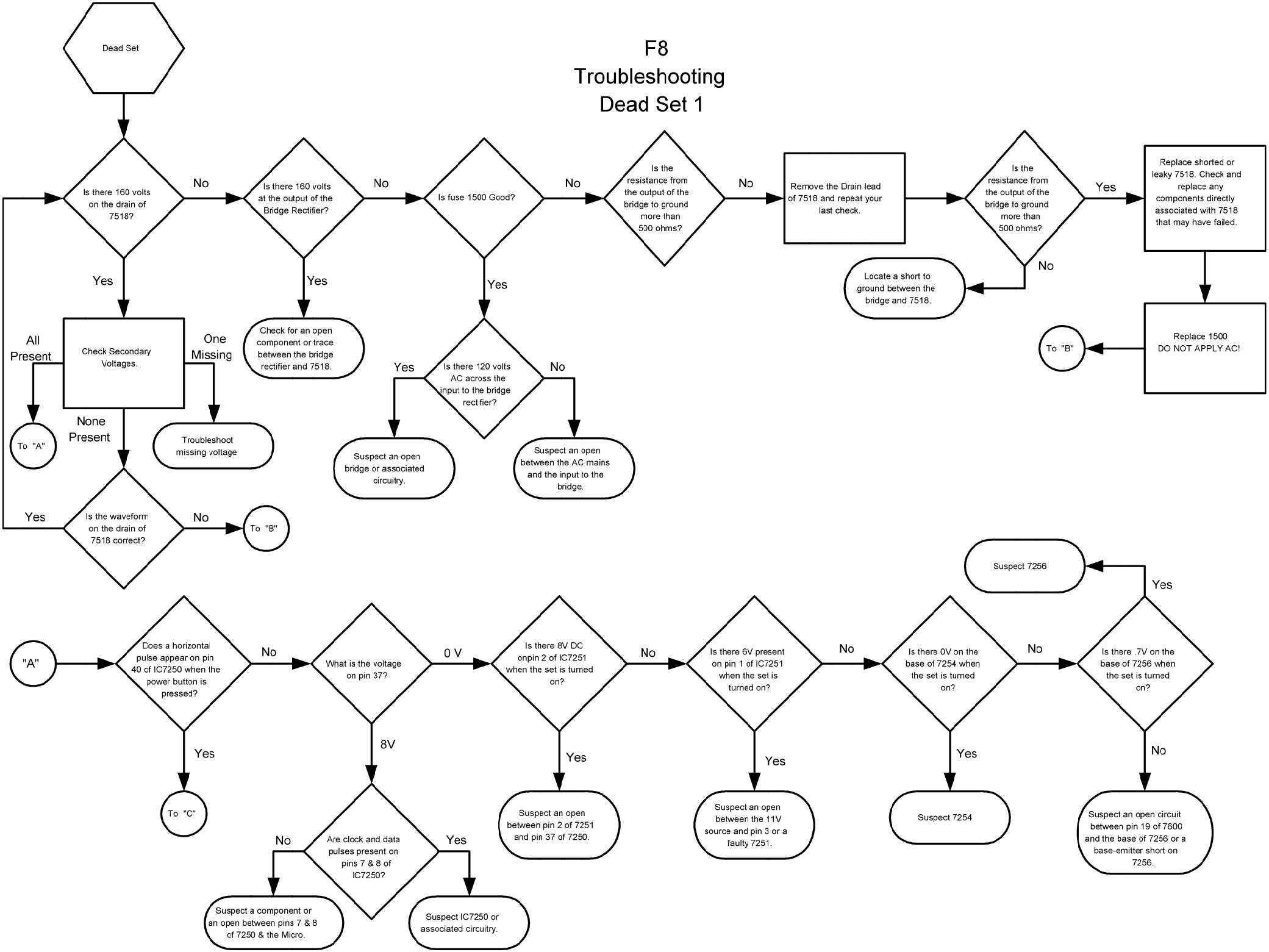
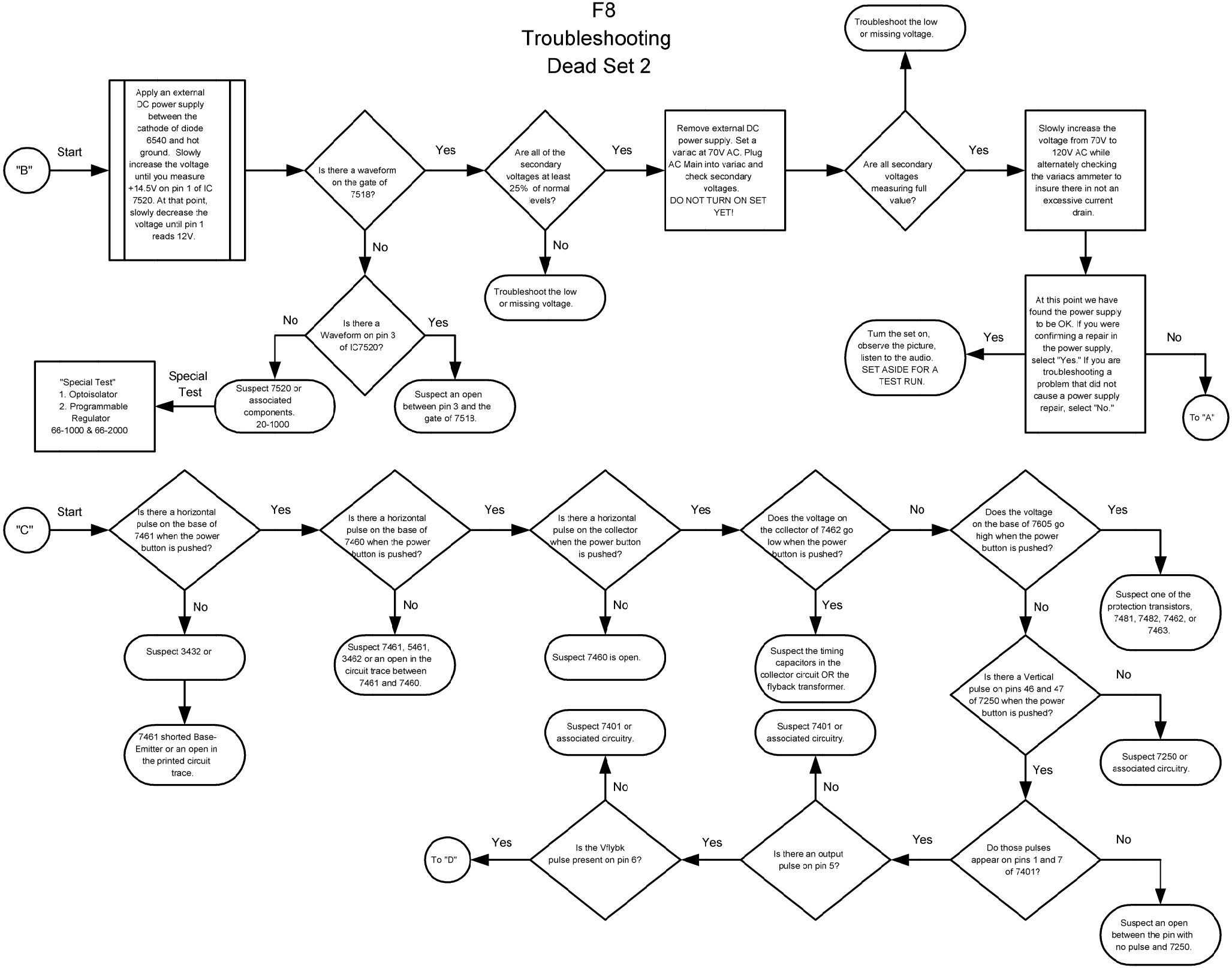
CAUTION: USE A SEPARATE ISOLATION TRANSFORMER FOR THIS UNIT WHEN SERVICING

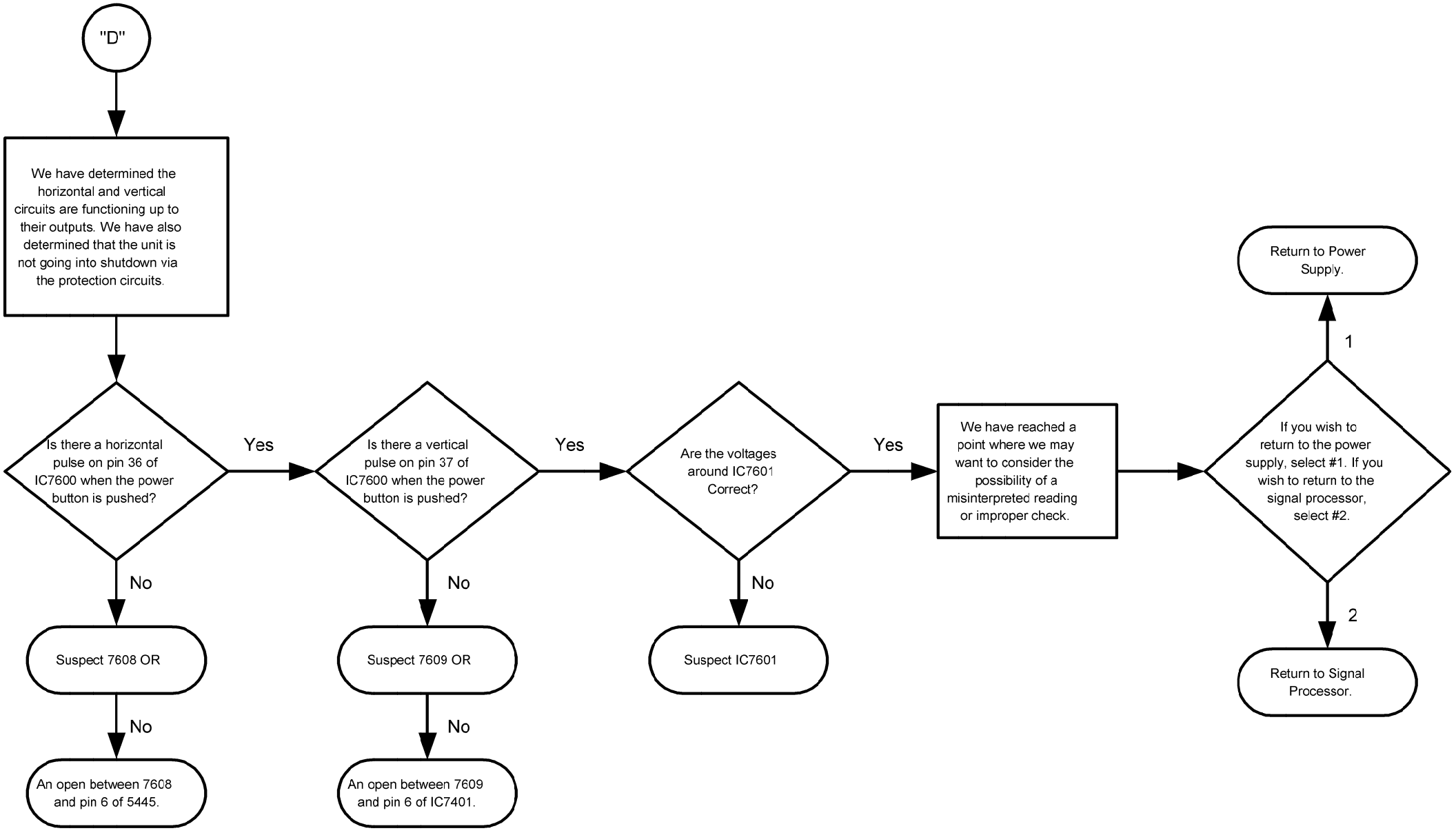
F8
Troubleshooting
Dead Set 1



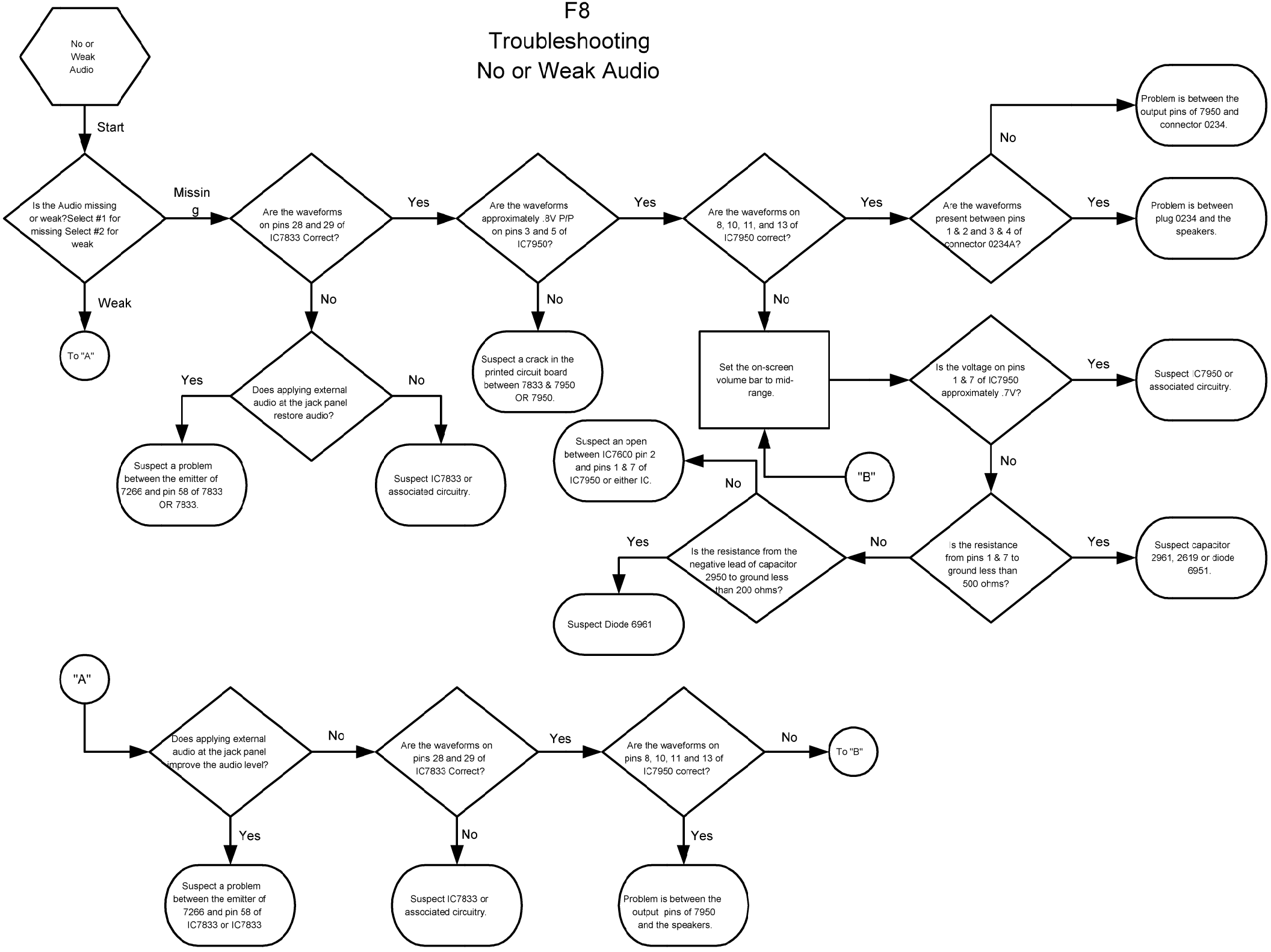
F8 Troubleshooting Dead Set 2



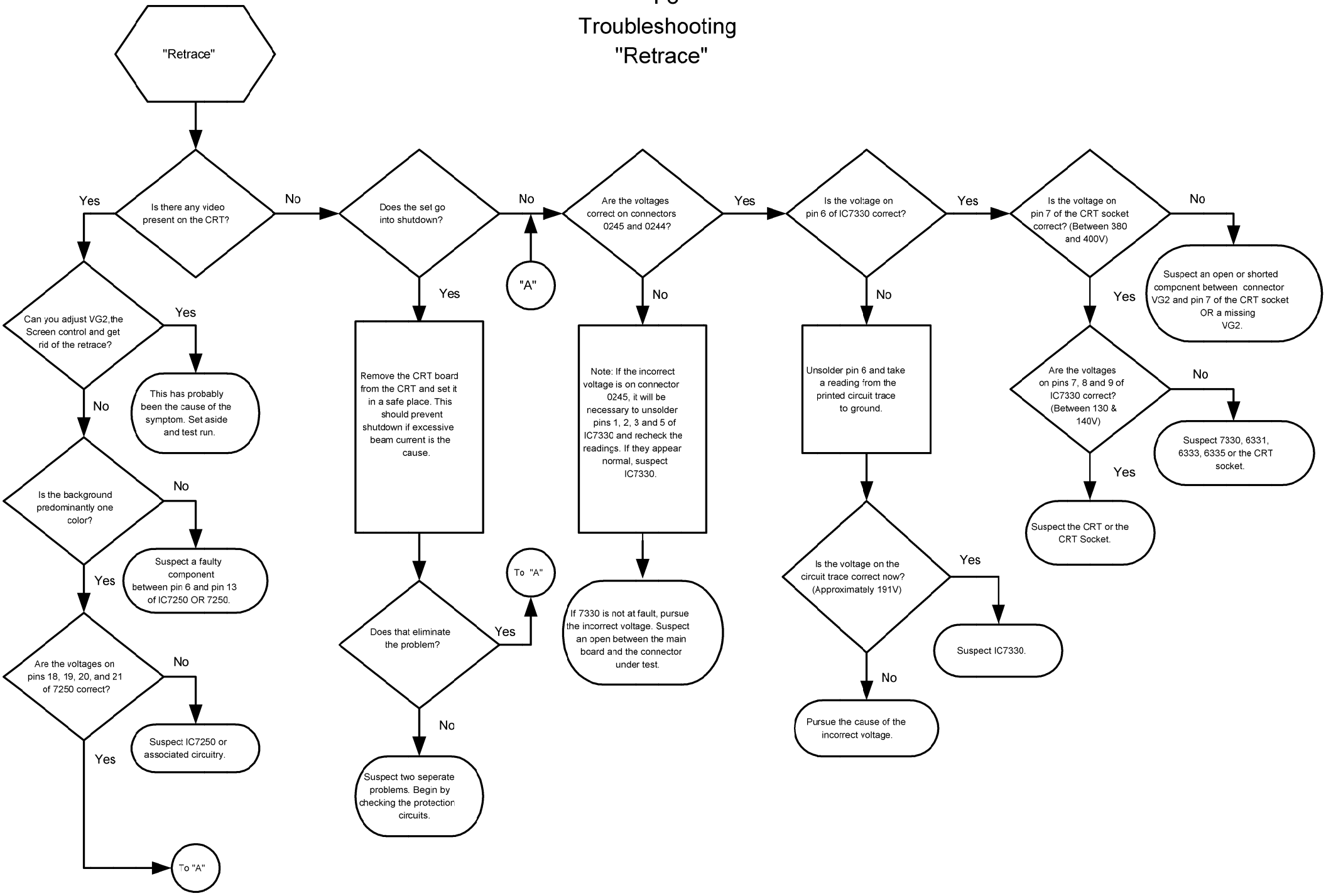
F8
Troubleshooting
Dead Set 3



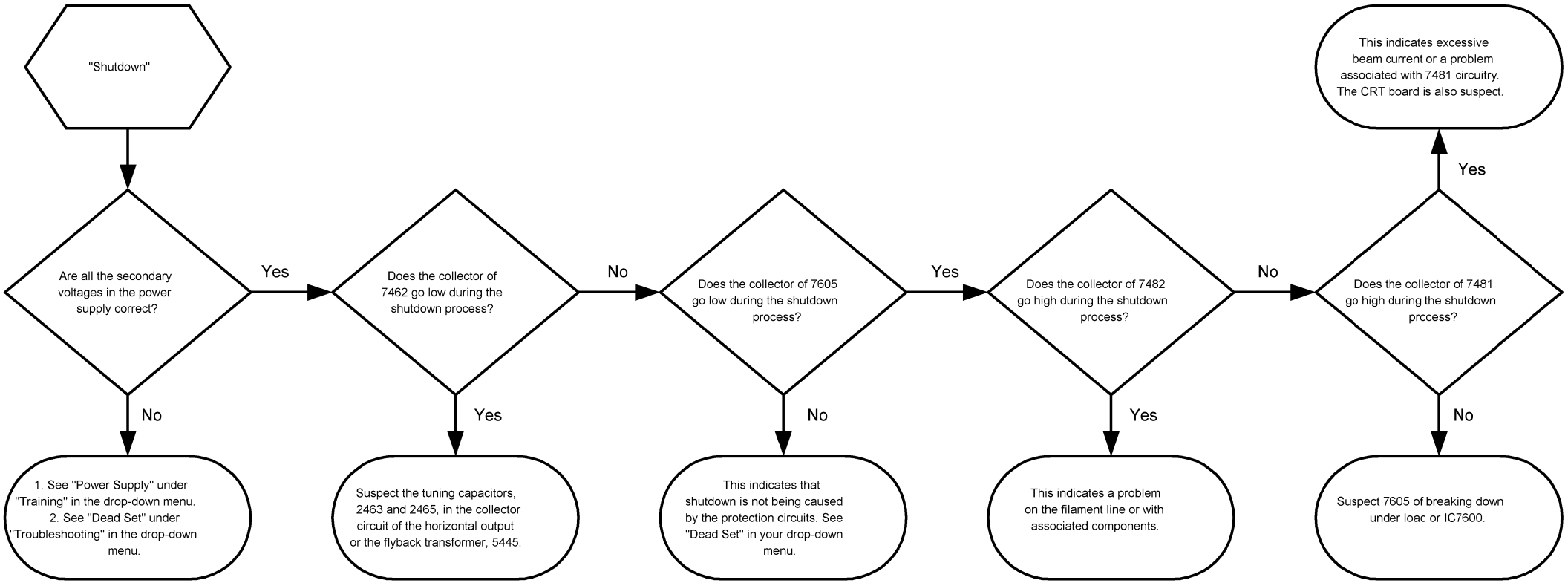
F8
Troubleshooting
No or Weak Audio



F8 Troubleshooting "Retrace"



F8
Flowchart
Troubleshooting
"Shutdown"



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General Information

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CAUTION: USE A SEPARATE ISOLATION TRANSFORMER FOR THIS UNIT WHEN SERVICING

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F8 CHASSIS INTRODUCTION

The F8 chassis is a leader TV chassis produced by Philips Consumer Electronics Company for the 1999 model year. The F8 chassis is used in sets with 25“ and 27“ screen sizes. The F8 chassis is a global design and is oriented front to rear, or ”north to south“, as it has been called. The F8 chassis tuning system features 181 channels with on-screen display (OSD). The main tuning system uses a tuner, a microcomputer IC, and a memory IC mounted on the main chassis. The microcomputer communicates with the memory IC, the customer keyboard, remote receiver, U/V tuner, signal processor IC and the audio output IC via the I^2C bus. The memory IC retains the settings for favorite stations, customer-preferred settings, and service/factory data.

The F8 chassis uses a Very Large Scale (VLSI) Integrated Circuit for signal processing. This IC performs video IF, sound IF processing, AGC control, horizontal and vertical drive and synchronization, also luminance/chrominance processing. The on-screen graphics and closed caption decoding are done within the microprocessor, and then sent to the signal processor IC to be added to the main signal.

The F8 chassis utilizes a switch mode power supply for the main voltage source. The chassis has a hot chassis ground reference on the primary side of the power supply, and a cold ground reference on the secondary side of the power supply and the rest of the chassis. **ALWAYS USE AN ISOLATION TRANSFORMER WHEN SERVICING THIS CHASSIS FOR YOUR SAFETY.**

MODEL TO MODULE LIST

The model to Module list shown below identifies all electrical panels, modules and assemblies used in each model produced with the F8 chassis. This information was current at time of printing.

Information concerning cabinet parts and cabinet mounted parts (CRT/Yoke/etc.) is shown in the Cabinet Replacement Parts List.

Replacement part numbers for each module are provided in the Chassis Panel Replacement Parts List.

If you are attempting to service a model equipped with the F8 chassis, the necessary electrical information should be covered in this service manual, even if the corresponding model number is not listed.

Model Panel Number	Size	Description
25PT10-C121 00EMF803-A002	25”	PHILIPS – MAGNAVOX Main Chassis
25PT15-C121 00EMF806 A002	25”	PHILIPS – MAGNAVOX Main Chassis
25TR19-C121 00EMF803-A001	25“	PHILIPS – MAGNAVOX Main Chassis
25TS56-C121 00EMF806-A001	25“	PHILIPS – MAGNAVOX Main Chassis
26LL59-0121 00EMF820-A001, A002	25“	PHILIPS - LATIN AMERICA Main Chassis
26LL59-1121 00EMF821-A001	25“	PHILIPS - LATIN AMERICA Main Chassis
26LW59-2221 00EMF822-A001, A002	25“	PHILIPS - LATIN AMERICA Main Chassis
26LW59-3221 00EMF823-A001	25“	PHILIPS - LATIN AMERICA Main Chassis
27TS57-C101 00EMF832-A101, A102	27“	PHILIPS – MAGNAVOX Main Chassis
27TS57-C121 00EMF832-A102	27”	PHILIPS – MAGNAVOX Main Chassis
29LL69-0121 00EMF850-A001, A002	27“	PHILIPS - LATIN AMERICA Main Chassis
29LL69-1121 00EMF851-A001	27“	PHILIPS - LATIN AMERICA Main Chassis
CH1927-C101 00EMF893-A102 00A10680-B002 00A10777-A001	27”	PHILIPS – INDUSTRIAL TELEVISION - SMARTPORT Main Chassis Channel One Card Interface Module
HD2511-C121 00EMF801-A001	25“	PHILIPS – MAGNAVOX Main Chassis
HD2530-C121 00EMF804-A001	25“	PHILIPS – MAGNAVOX Main Chassis
HD2720-C101 00EMF830-A101 or 00EMF831-A102	27“	PHILIPS – MAGNAVOX Main Chassis
LL9125-C121	25”	PHILIPS – INDUSTRIAL TELEVISION - SMARTPORT

00EMF899-A002		Main Chassis
MS2530C221	25"	PHILIPS – MAGNAVOX
313917808991		Main Chassis
MS2530C225	25"	PHILIPS – MAGNAVOX
313917808991		Main Chassis
MS2730C221	27"	PHILIPS – MAGNAVOX
313917868471		Main Chassis
OCC925-C121	25“	PHILIPS – MAGNAVOX
00EMF891 A001		Main Chassis
00A10777-A001		Interface Module
OCC927-C101	27“	PHILIPS – MAGNAVOX
00EMF893 A001, A102		Main Chassis
00A10777-A001		Interface Module
PA9027-C101	27”	PHILIPS – INDUSTRIAL TELEVISION - SMARTPORT
00EMF894 A102		Main Chassis
00AVJ250 A001		Pro video Card Assembly
00A10757 A001		L9 Audio Jack Panel
00A10778 A001		L9 ITV Front A-V
00A10791 A001		Comb Filter Panel
00A10808 A001		Pro Plus Interface
PA9032-C101	32”	PHILIPS – INDUSTRIAL TELEVISION - SMARTPORT
00EMF895 A102		Main Chassis
00AVJ250 A001		Pro video Card Assembly
00A10757 A001		L9 Audio Jack Panel
00A10791 A001		Comb Filter Panel
00A10808 A001		Pro Plus Interface
PC9225-C121	25“	PHILIPS – MAGNAVOX
00EMF891-A001, A102		Main Chassis
00A10777-A001		Interface Module
PC9227-C101	27“	PHILIPS INDUSTRIAL TELEVISION - CARD SET
00EMF893-A101, A102		Main Chassis
00A10777-A001		Interface Module
PL9125-C121	25“	PHILIPS – INDUSTRIAL TELEVISION - SMARTPORT
00EMF890-A001, A002		Main Chassis
PL9127-C101	27“	PHILIPS – INDUSTRIAL TELEVISION - SMARTPORT
00EMF892-A101, A102		Main Chassis
PPC927-C101	27”	PHILIPS – INDUSTRIAL TELEVISION - SMARTPORT
00EMF894 A102		Main Chassis
00A10791 A001		Comb Filter Panel
00A10757 A001		L9 Audio Jack Panel
00A10778 A001		L9 ITV Front A/V
00A10808 A001		Pro Plus Interface
PPC932-C101	32”	PHILIPS – INDUSTRIAL TELEVISION - SMARTPORT

00EMF895 A102		Main Chassis
00A10757 A001		L9 Audio Jack Panel
00A10791 A001		Comb Filter Panel
00A10808 A001		Pro Plus Interface
SC2932C121	32"	PHILIPS INDUSTRIAL TELEVISION - CARD SET
313501700770		Scan Card
00A10808 A001		Pro Plus Interface
00A10757 A001		Audio Jack Panel
00AVJ222 A001		Scan Converter Card
00A10654 A001		Scan Converter Jack Panel
00EMF895 A002		Main Chassis
00A10791 A001		Comb Filter Panel
SCN927-C101	27”	PHILIPS – INDUSTRIAL TELEVISION - SMARTPORT
00EMF894 A102		Main Chassis
00A10757 A001		L9 Audio Jack Panel
00A10777 A001		Interface Module
00A10778 A001		L9 ITV Front A/V
00A10791 A001		Comb Filter Panel

SCN932C101	32”	PHILIPS – INDUSTRIAL TELEVISION - SMARTPORT
00EMF895 A102		Main Chassis
00A10757 A001		L9 Audio Jack Panel
00A10777 A001		Interface Module
00A10791 A001		Comb Filter Panel
TC9225-C121	25“	PHILIPS – MAGNAVOX
00EMF891-A001, A002		Main Chassis
00A10777-A001		Interface Module
TL9125-C121	25“	PHILIPS – INDUSTRIAL TELEVISION - SMARTPORT
00EMF890-A001, A002		Main Chassis
TL9127-C101	27“	PHILIPS – INDUSTRIAL TELEVISION - SMARTPORT
00EMF892-A101, A102		Main Chassis
TR2503-C121	25“	PHILIPS – MAGNAVOX
00EMF801-A001		Main Chassis
TR2519-C121	25“	PHILIPS – MAGNAVOX
00EMF803-A001		Main Chassis
TS2546-C121	25“	PHILIPS – MAGNAVOX
00EMF804-A001, A002		Main Chassis
TS2556-C121	25“	PHILIPS – MAGNAVOX
00EMF806-A001, A002		Main Chassis
TS2575-C121	25“	PHILIPS – MAGNAVOX
00EMF807-A001, A002		Main Chassis
TS2746-C101	27“	PHILIPS – MAGNAVOX
00EMF830-A101, A102		Main Chassis
TS2746-C121	27“	PHILIPS – MAGNAVOX
00EMF830-A102		Main Chassis
TS2757-C101	27“	PHILIPS – MAGNAVOX
00EMF832-A101		Main Chassis
TS2774-C101	27“	PHILIPS – MAGNAVOX
00EMF833-A101, A102		Main Chassis
TS2774-C121	27“	PHILIPS – MAGNAVOX
00EMF833-A102		Main Chassis
TS3256-C101	32”	PHILIPS – MAGNAVOX
00EMF880-A102		Main Chassis
TS3256-C121	32”	PHILIPS – MAGNAVOX
00EMF880-A002		Main Chassis
XR2503-C121	25“	PHILIPS – MAGNAVOX
00EMF801-A001, A002		Main Chassis
XS2556-C121	25“	PHILIPS – MAGNAVOX

00EMF806-A001, A002 Main Chassis

XS2757-C101 27“ PHILIPS – MAGNAVOX
00EMF832-A101, A102 Main Chassis

Remote Replacement	RC0702/04 3139 148 54201	RCO705/00 3139 228 80571 RC0705	RC282901/01 3139 228 81441 Philips	RC282901/04 3139 228 81451 PH/MX	RC2524/04 3139 228 81591	RC2528/04 3139 228 82051 RCU82D
Remote Drawing	**RC0702**	----------	**RCL9UB**	**RCL9UB**	**RCU82C**	----------
TR2503-C121	**X**					
25TR19-C121				**X**		
25TS56-C121				**X**		
26LL59-0121			**X**			
26LL59-1121			**X**			
26LW59-2221			**X**			
26LW59-3221			**X**			
27TS57-C101					**X**	
29LL69-0121			**X**			
29LL69-1121			**X**			
HD2511-C121	**X**					
HD2530-C121	**X**					
HD2720-C101						**X**
TL9125-C121		**X**				
TL9127-C101		**X**				
TR2519-C121				**X**		
TS2546-C121	**X**					
TS2556-C121				**X**		
TS2575-C121					**X**	
TS2746-C101	**X**					
TS2757-C101					**X**	
TS2774-C101					**X**	
XR2503-C121	**X**					
XS2556-C121				**X**		
XS2757-C101					**X**	
OCC925-C121	No Remote					
OCC927-C101	No Remote					
PC9225-C121	No Remote					
PC9227-C101	No Remote					
PL9125-C121	No Remote					
PL9127-C101	No Remote					
TC9225-C121	No Remote					

Display Quick-Use Guide for RC0702 Transmitter
Display Quick-Use Guide for RCU82C Transmitter

MODEL TO REMOTE CROSS-REFERENCE

Remote Replacement	RC0702/04 3139 148 54201	RCO705/00 3139 228 80571 RC0705	RC282901/01 3139 228 81441 Philips	RC282901/04 3139 228 81451 PH/MX	RC2524/04 3139 228 81591	RC2528/04 3139 228 82051 RCU82D
Remote Drawing	**RC0702**	----------	**RCL9UB**	**RCL9UB**	**RCU82C**	----------
TR2503-C121	X					
25TR19-C121				X		
25TS56-C121				X		
26LL59-0121			X			
26LL59-1121			X			
26LW59-2221			X			
26LW59-3221			X			
27TS57-C101					X	
29LL69-0121			X			
29LL69-1121			X			
HD2511-C121	X					
HD2530-C121	X					
HD2720-C101						X
TL9125-C121		X				
TL9127-C101		X				
TR2519-C121				X		
TS2546-C121	X					
TS2556-C121				X		
TS2575-C121					X	
TS2746-C101	X					
TS2757-C101					X	
TS2774-C101					X	
XR2503-C121	X					
XS2556-C121				X		
XS2757-C101					X	
OCC925-C121	No Remote					
OCC927-C101	No Remote					
PC9225-C121	No Remote					
PC9227-C101	No Remote					
PL9125-C121	No Remote					
PL9127-C101	No Remote					
TC9225-C121	No Remote					

Display Quick-Use Guide for RC0702 Transmitter
Display Quick-Use Guide for RCU82C Transmitter
Display Quick-Use Guide for RCL9UB Transmitter

MODEL TO JACKPANEL CROSS-REFERENCE

Display JP9000 Jack Panel
Display JP9103 Jack Panel
Display JP9106 Jack Panel

Models	Jack Panels		
	JP9000	JP9103	JP9106
TR2503-C121	X		
25TR19-C121	X		
25TS56-C121		X	
26LL59-0121		X	
26LL59-1121		X	
26LW59-2221			X
26LW59-3221			X
27TS57-C101		X	
29LL69-0121			X
29LL69-1121			X
HD2511-C121	X		
HD2530-C121	X		
HD2720-C101		X	
TR2503-C121	X		
TR2519-C121	X		
TS2546-C121	X		
TS2556-C121		X	
TS2575-C121			X
TS2746-C101		X	
TS2757-C101		X	
TS2774-C101			X
XR2503-C121	X		
XS2556-C121		X	
XS2757-C101		X	
TL9125-C121	No Jack Panel		
TL9127-C101	No Jack Panel		
OCC925-C121	No Jack Panel		
OCC927-C101	No Jack Panel		
PC9225-C121	No Jack Panel		
PC9227-C101	No Jack Panel		
PL9125-C121	No Jack Panel		
PL9127-C101	No Jack Panel		
TC9225-C121	No Jack Panel		

GLOSSARY OF TERMS, ACRONYMS, AND ABBREVIATIONS

2CS	Two Channel Stereo
AFC	Automatic Frequency Control
AFT	Automatic Fine Tuning
AP	Asia Pacific
ATS	Automatic Tuning System
AV	External Audio/Video
AVL	Automatic Volume Level control
BTSC	Broadcast Television Standard Committee (TV Stereo)
CBA	Circuit Board Assembly (PCB)
CC	Closed Captioning
CSM	Customer Service Mode
CVBS	Color Video Blanking Sync
DNR	Dynamic Noise Reduction
EEPROM	Electrical Erasable Programmable Read-Only Memory
Error Buffer	Register that keeps track of errors that occur and stores error codes
Error Code	A numerical value used to indicate a failure in the television
EU	Europe
EXT	External audio/video input
FM	Frequency Modulation
I²C	Inter IC bus, 2-wire bi-directional (SCL/SDA)
ID	Identification
IDENT	Horizontal coincidence signal, transmitter identification
IF	Intermediate Frequency
IN	ITT sound IC with NICAM function
IT	ITT sound IC without NICAM function
LATAM	Latin America
LED	Light Emitting Diode
Local Keyboard	The buttons (usually volume up, volume down, channel up, and channel down) located on the front of the television set
MA	Mono All; single mono carrier receiver
NR	Noise Reduction
NTSC	National Television Systems Committee (video)
NVM	Non Volatile Memory
OB	Option Byte (Feature Byte)
OSD	On Screen Display
PCB	Printed Circuit Board (CBA)
PIP	Picture In Picture
PLL	Phase Locked Loop
PP	Personal Preference
RAM	Random Access Memory
RC	Remote Control
RC-5	Remote Control system 5
RGB	Red Green Blue
ROM	Read Only Memory
SAM	Service Alignment Mode
SAP	Second Audio Program
SCL	Serial Clock
SDA	Serial Data
SDM	Service Default Mode
SVHS	Super Video Home System
Top Level Menu	This refers to the main menu (as opposed to sub menus) in SAM
V-Chip	Violence-Chip

VCR	Video Cassette Recorder
Y/C	Luminance/Chrominance (video)

SAFETY INSTRUCTIONS FOR REPAIRS

1. Safety regulations require that during a repair:

   - the set should be connected to the mains via an isolating transformer
   - safety components, indicated by the symbol s , should be replaced by components identical to the original ones
   - when replacing the CRT, safety goggles must be worn

2. Safety regulations require that after a repair the set must be returned in its original condition. In particular, attention should be paid to the following points:

   Note:
   This resoldering is advised to prevent bad connections due to metal fatigue in solder joints, and is therefore only necessary for television sets older than 2 years.

   - As a strict precaution, we advise you to resolder the solder joints through which the horizontal deflection current is flowing, in particular:
     - All pins of the line output transformer (LOT)
     - flyback capacitor(s)
     - S-correction capacitor(s)
     - line output transistor
     - pins of the connector with wires to the deflection coil
     - other components through which the deflection current flows
   - Resolder points are marked by a white circle on the bottom of the CBA.
   - The wire trees and EHT cable should be routed correctly and fixed with the mounted cable clamps.
   - The insulation of the mains lead should be checked for external damage.
   - The mains lead strain relief should be checked for its function in order to avoid touching the CRT, hot components or heat sinks.
   - The electrical DC resistance between the mains plug and the secondary side should be checked (only for sets which have a mains isolated power supply).

   This check can be done as follows:
     - unplug the mains cord and connect a wire between the two pins of the mains plug
     - set the mains switch to the on position (keep the mains cord unplugged!)
     - measure the resistance value between the pins of the mains plug and the metal shielding of the tuner or the aerial connection on the set. The reading should be between 4.5 Megohm and 12 Megohm.
     - switch off the TV and remove the wire between the two pins of the mains plug
   - The cabinet should be checked for defects to avoid touching of any inner parts by the customer.

	JP9000	JP9103	JP9106	JP9202	JP9204	JP9403	JP9406	JP9410	JP9411	JP9519	JP9523
RF Input/ Antenna	75 ohm	75 ohm	75 ohm	75 ohm	75 ohm	75 ohm	75 ohm	75 ohm	75 ohm	2 x 75 ohm	2 x 75 ohm
Jacks Quantity	0	3	6	2	4	3	7	10	11	19	23
Video Input		1	1	1	1	1	1	2	2	3	3

JACK PANEL DEFINITIONS

	JP9000	JP9103	JP9106	JP9202	JP9204	JP9403	JP9406	JP9410	JP9411	JP9519	JP9523
RF Input/ Antenna	75 ohm	75 ohm	75 ohm	75 ohm	75 ohm	75 ohm	75 ohm	75 ohm	75 ohm	2 x 75 ohm	2 x 75 ohm
Jacks Quantity	0	3	6	2	4	3	7	10	11	19	23
Video Input		1	1	1	1	1	1	2	2	3	3
Audio Input		L-R	L-R	1	L-R	1	L-R	2 (L-R)	2 (L-R)	"3(L-R) 2-Rear, 1-Side"	"3(L-R) 2-Rear, 1-Side"
SVHS Input									1	2 (1-Rear/ 1-Side)	2 (1-Rear/ 1-Side)
ead-phon					Front	Front		Front	Front	Side	Side
Surround Sound											4
Speaker Out											
Video Out			1				1	1	1	1	1
Audio Output			L-R (Fixed)				L-R (Fixed)	L-R (Fixed)	L-R (Fixed)	L-R*	L-R*
Smart Plug											
CH. 1 Demod.											
Theft Control											
Pillow Control											
Guide + Gold										1	1
YUV Comp. In										3	3

"* Only one set of audio output jacks, menu selectable, switchable between fixed and variable output"

MAIN CHASSIS SCHEMATIC NOTES:

UNLESS OTHERWISE SPECIFIED:

1. ALL VOLTAGES AND WAVEFORMS WERE TAKEN UNDER THE FOLLOWING CONDITIONS:
   - LINE VOLTAGE MAINTAINED AT 120VAC, 60Hz VIA AN ISOLATION TRANSFORMER.
   - SET IN SDM (SERVICE DISPLAY MODE). To enter SDM, press 0-6-2-5-9-6-Menu on the remote control.
   - ALL VOLTAGES WERE TAKEN FROM MODEL TS2774C101.
2. ALL WAVEFORMS WERE TAKEN WITH AN NTSC SIGNAL GENERATOR DELIVERING 10mVp-p AT THE ANTENNA INPUT.
3. ON VOLTAGE CHARTS:
   - VOLTAGES IN THE "Signal" COLUMN WERE TAKEN WITH AN NTSC SIGNAL GENERATOR DELIVERING 10mVp-p AT THE ANTENNA INPUT.
   - VOLTAGES IN THE "No Signal" COLUMN WERE TAKEN WITH NO SIGNAL APPLIED.
   - VOLTAGES IN THE "Standby" COLUMN WERE TAKEN WITH THE SET IN STANDBY MODE (Power supplied to the chassis, set turned off).
4. ALL VOLTAGES ARE POSITIVE DC WITH RESPECT TO GROUND IN THAT SECTION OF THE CHASSIS, AND MAY VARY DUE TO NORMAL PRODUCTION TOLERANCES.
5. COMPONENT AND SPECIAL SYMBOLS:
   * INDICATES A COMPONENT WHICH WILL VARY DEPENDING ON SCREEN SIZE, PRODUCTION DATES, AND OPTION FEATURES INSTALLED. PLEASE SEE THE REPLACEMENT PARTS LIST FOR SPECIFIC PART INFORMATION.
   • INDICATES A COMPONENT IS AN SMD ”CHIP“ TYPE COMPONENT, AND AS SUCH WILL BE LOCATED ON THE BOTTOM Side OF THE CBA.
6. A HIGH VOLTAGE OSCILLOSCOPE PROBE (100:1) IS NEEDED TO MEASURE THE WAVEFORM AT THE HORIZONTAL OUTPUT TRANSISTOR (PART # 7620).
7. SPARK GAPS SHOWN ON THE CRT SCHEMATIC ARE INTERNAL TO THE CRT SOCKET.
8. THE NUMBERS 1a THROUGH 38b, SHOWN IN ENCLOSED BOXES, CORRESPOND TO THE WAVEFORM PHOTOGRAPHS.
9. FOR VOLTAGE, WATTAGE, AND TOLERANCE RATINGS OF RESISTORS AND CAPACITORS, PLEASE SEE THE ELECTRICAL REPLACEMENT PARTS LIST.
10.  INDICATES PCE REPLACEMENT PART NUMBER ONLY.

MAIN CHASSIS WAVEFORM NOTES:

UNLESS OTHERWISE SPECIFIED:
ALL WAVEFORMS WERE TAKEN UNDER THE FOLLOWING CONDITIONS:

- LINE VOLTAGE MAINTAINED AT 120VAC, 60Hz VIA AN ISOLATION TRANSFORMER.
- SET IN SDM (SERVICE DISPLAY MODE). TO ENTER SDM, PRESS 0-6-2-5-9-6-MENU ON THE REMOTE CONTROL.
- ALL WAVEFORMS WERE TAKEN FROM MODEL TS2774-C101.
- ALL WAVEFORMS WERE TAKEN WITH AN NTSC SIGNAL GENERATOR DELIVERING 10mVp-p AT THE ANTENNA INPUT.
- SWEEP TIME/CM SETTINGS ARE SHOWN WITH THE FIGURES IN THE CALIBRATED POSITION.
- THE ACTUAL SWEEP TIMES AND VOLTAGES PRESENT ARE SHOWN WHEREVER POSSIBLE.

- COMPOSITE VIDEO SIGNALS ARE SHOWN WITHOUT SWEEP TIME AND VOLTAGES PRESENT BECAUSE THESE SIGNALS HAVE VARIABLE SWEEP TIMES AND VOLTAGES.
- A HIGH VOLTAGE OSCILLOSCOPE PROBE (100:1) IS NEEDED TO MEASURE THE WAVEFORM AT THE HORIZONTAL OUTPUT TRANSISTOR (PART # 7460).
- THE DESIGNATORS A1a THROUGH V6c, SHOWN IN ENCLOSED BOXES, CORRESPOND TO THE WAVEFORM PHOTOGRAPHS.

AUDIO WAVEFORM NOTES:

THESE NOTES APPLY ONLY TO THE AUDIO WAVEFORMS (A1a THROUGH A3d).
AUDIO WAVEFORMS WERE TAKEN UNDER THE FOLLOWING CONDITIONS:

- ALL WAVEFORMS WERE TAKEN WITH A LEADER LMS-238 SOUND GENERATOR CONNECTED AT THE ANTENNA INPUT, WITH THE FOLLOWING SETTINGS:
- INT FREQUENCY SET TO 1kHz
- STEREO (L+R), PILOT ON
- VIF/RF OUTPUT AT CHANNEL 3
- ALL WAVEFORMS WERE TAKEN FROM MODEL TS2774C101.
- TELEVISION SET TO CHANNEL 3 IN NORMAL MODE.
- DO NOT MUTE THE SET.
- SET THE TELEVISION VOLUME AT 40.
- THE SPEAKERS MAY BE DISCONNECTED AT CONNECTOR #0234 (BOARD LOCATION B-1) IF THE AUDIO OUTPUT CAUSES A DISTRACTION TO THE SERVICER.

OPTION BYTES & FEATURE LISTING

USA/CANADIAN CHASSIS LISTINGS

LATIN AMERICAN CHASSIS LISTINGS

INDUSTRIAL CHASSIS LISTINGS

TV Remote Buttons

RC0702 Remote Transmitter

Power Button
Press to turn the TV ON and OFF.

Channel (+), (–) Buttons
Press to change the tuned channel.

Status/Exit Button
Press to see the current channel number on the TV screen. Also press to clear the TV screen after control adjustments.

Cursor Buttons
Use these buttons to select and adjust the TV's onscreen menu.

Volume (+), (–) Buttons
Press to adjust the TV sound level.

Mute Button
Press to turn the sound OFF on the TV. Press again to return the sound to its previous level.

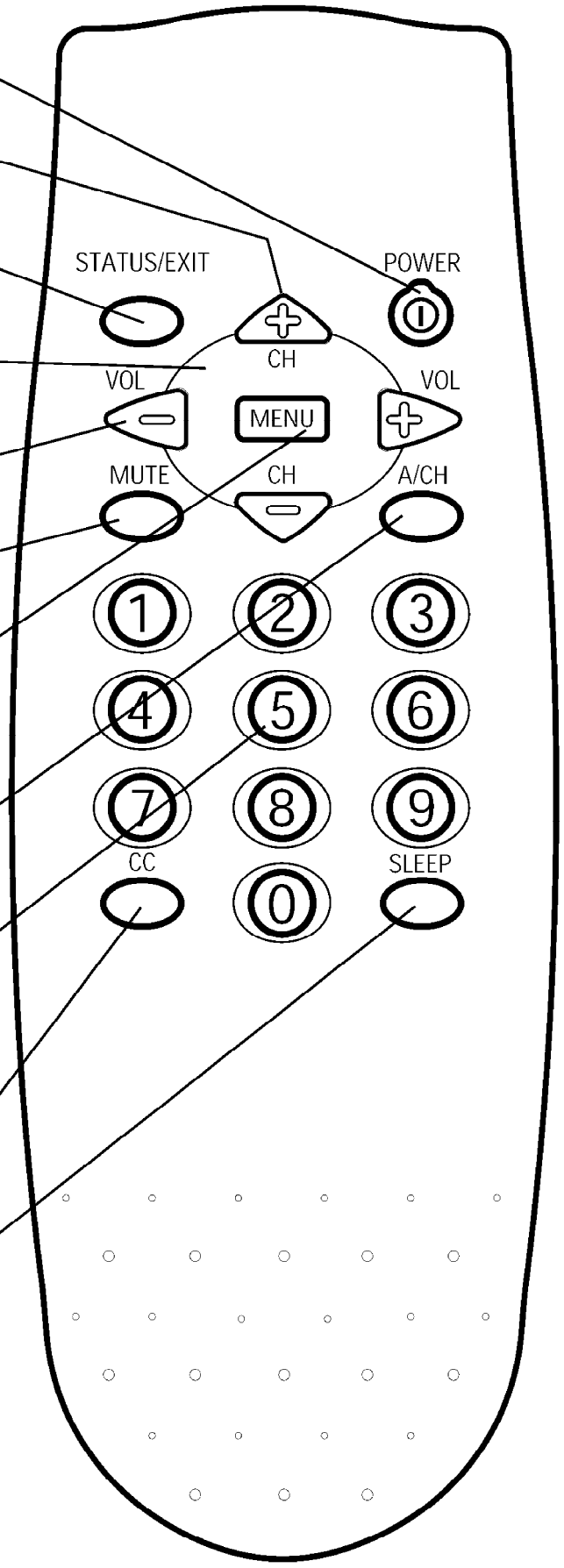
Menu Button
Press for the onscreen menu to appear. Pressing the menu button after menu selections are made will return you to the previous menu screen or eliminate the menu from the display.

A/CH Button
Press to toggle between the currently viewed channel and the previously viewed channel.

Number Buttons
Press the number buttons to select TV channels. For single channel entries, press the numbered button of the channel you desire. The TV will pause for a few seconds before changing to the selected channel. For channels 100 and above, press "1" first, then the next two numbered buttons.

CC Button
Press to select Closed Caption options within the menu.

Sleep Button
Press to set the TV to automatically turn itself OFF.



TV Remote Buttons

RCU82C Remote Transmitter

Sleep Button
Press to set the TV to automatically turn itself OFF. Also can be used as an Enter button when sending channel commands to remote controlled cable converters or VCRs.

Status/Exit Button
Press to see the current channel number on the TV screen. Also press to clear the TV screen after control adjustments.

A/CH-Record Button
Press to toggle between the currently viewed channel and the previously viewed channel. When in the VCR mode, press to start the recording of a video tape.

TV/VCR/ACC Mode Switch
Slide to TV position to control TV functions; VCR to control VCR functions; and ACC for Cable Converter, DBS, DVD, etc. functions.

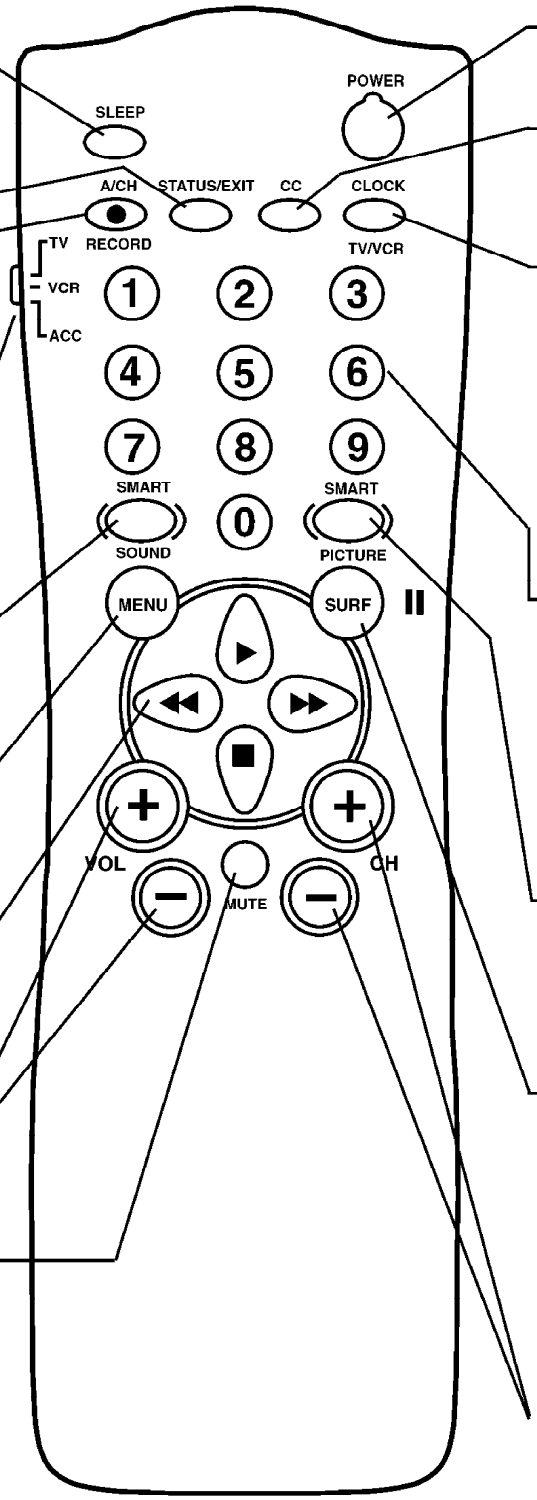
SmartSound™ Button
Press to select from a list of SmartSound controls. (Factory preset sound control levels set for different types of listening, based on the type of programming being used.)

Menu Button
Press for the onscreen menu to appear. Pressing the menu button after menu selections are made will eliminate the menu from the display.

Cursor Buttons
Use these buttons to select and adjust the TV's onscreen menu. Also used with a VCR for PLAY, FAST FORWARD, REWIND, and STOP.

Volume (+), (–) Buttons
Press to adjust the TV sound level.

Mute Button
Press to turn the sound OFF on the TV. Press again to return the sound to its previous level.



Power Button
Press to turn the TV (or select VCR/ Cable Converter) ON and OFF.

CC Button
Press to select Closed Caption options within the menu. (Refer to the Owner's Manual for details.)

Clock-TV/VCR Button
When used in the TV mode, the CLOCK-TV/VCR button will access the Clock menu options.
Press while in the VCR mode (VCR indicator on the front of the unit will light) to view the playback of a tape. Press again to place in the TV position (VCR indicator light will go off) to view one program while recording another program.

Number Buttons
Press the number buttons to select TV channels. When selecting single digit channels, press the number of the desired channel. The TV will pause for a few seconds then tune to the selected channel. (Note: you can press "0", then the number also.) For channels "100" and above, first press "1" then the next two numbers of the desired channel.

SmartPicture™ Button
Press to select from a list of SmartPicture controls. (Factory preset picture control levels set for different types of viewing sources and programs.)

Surf Button
Press to select previously viewed channels. You can place up to 8 channels in memory. Then by pressing the SURF button you can quickly view the select channels. See the "Surf" section (in your other owner's manual) to see how to select a series of channels using the Surf button. When in the VCR mode, pressing this button will pause the playback of a video tape.

Channel (+), (–) Buttons
Press to change the tuned channel.

TV Remote Buttons

RCL9UB Remote Transmitter

Power Button
Press to turn the TV ON and OFF.

Sleep Button
Press to set the TV to automatically turn itself OFF.

CC Button
Press to select Closed Caption options within the menu.

Clock Button
Press for direct entry of the TIMER (Clock) features were you can set the TV's clock, the Start Time, and the Start Channel Controls.

Number Buttons
Press the number buttons to select TV channels. For single digit entries, press the number of the channel you desire. The TV will pause for a few seconds, then change to the selected channel. For channels 100 and above, press "1" then the next two numbers. (Example, Press "1", then "2", then "5" for channel 125.)

A/CH Button
Press to toggle between the currently viewed channel and the previously viewed channel.

Surf Button
Press to select previously viewed channels. You can place up to 8 channels in memory. Then by pressing the SURF button you can quickly view the select channels. See the "Surf" section to see how to select a series of channels using the Surf button.

Menu Button
Press for the onscreen menu to appear. Pressing the menu button after menu selections are made will eliminate the menu from the display.

Status/Exit Button
Press to see the current channel number on the TV screen. Also press to clear the TV screen after control adjustments.

Cursor Buttons
Use these button to select and adjust the TV's onscreen menu.

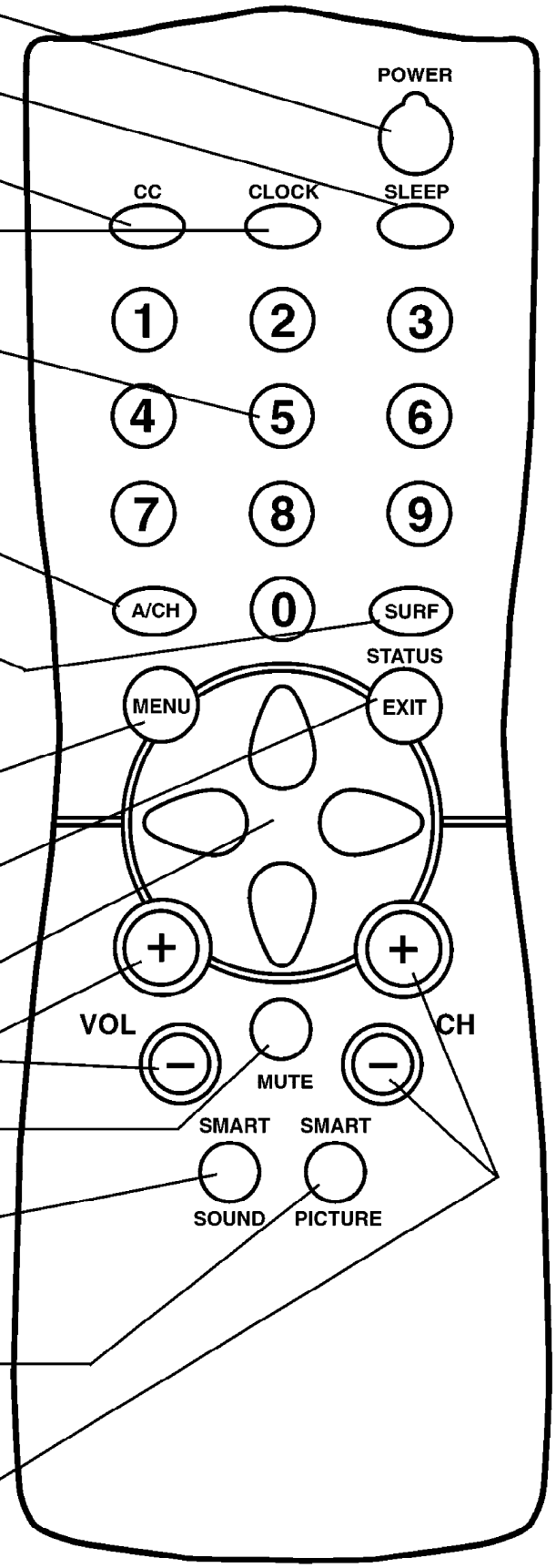
Volume (+), (–) Buttons
Press to adjust the TV sound level.

Mute Button
Press to turn the sound OFF on the TV. Press again to return the sound to its previous level.

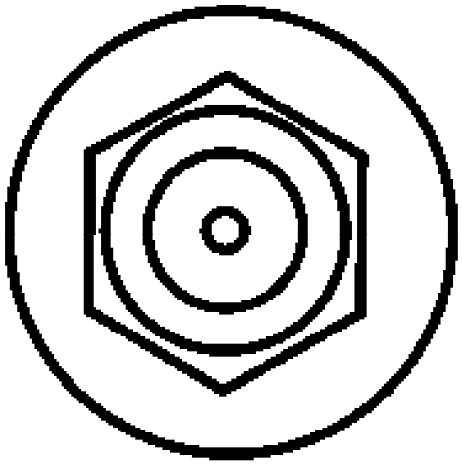
Smart Sound Button
Press to select from a list of Smart Sound controls. (Factory preset sound control levels set for different types of listening sources and programs.)

Smart Picture Button
Press to select from a list of Smart Picture controls. (Factory preset picture control levels set for different types of viewing sources and programs.)

Channel (+), (–) Buttons
Press to change the tuned channel.



Display JP9000 Jack Panel



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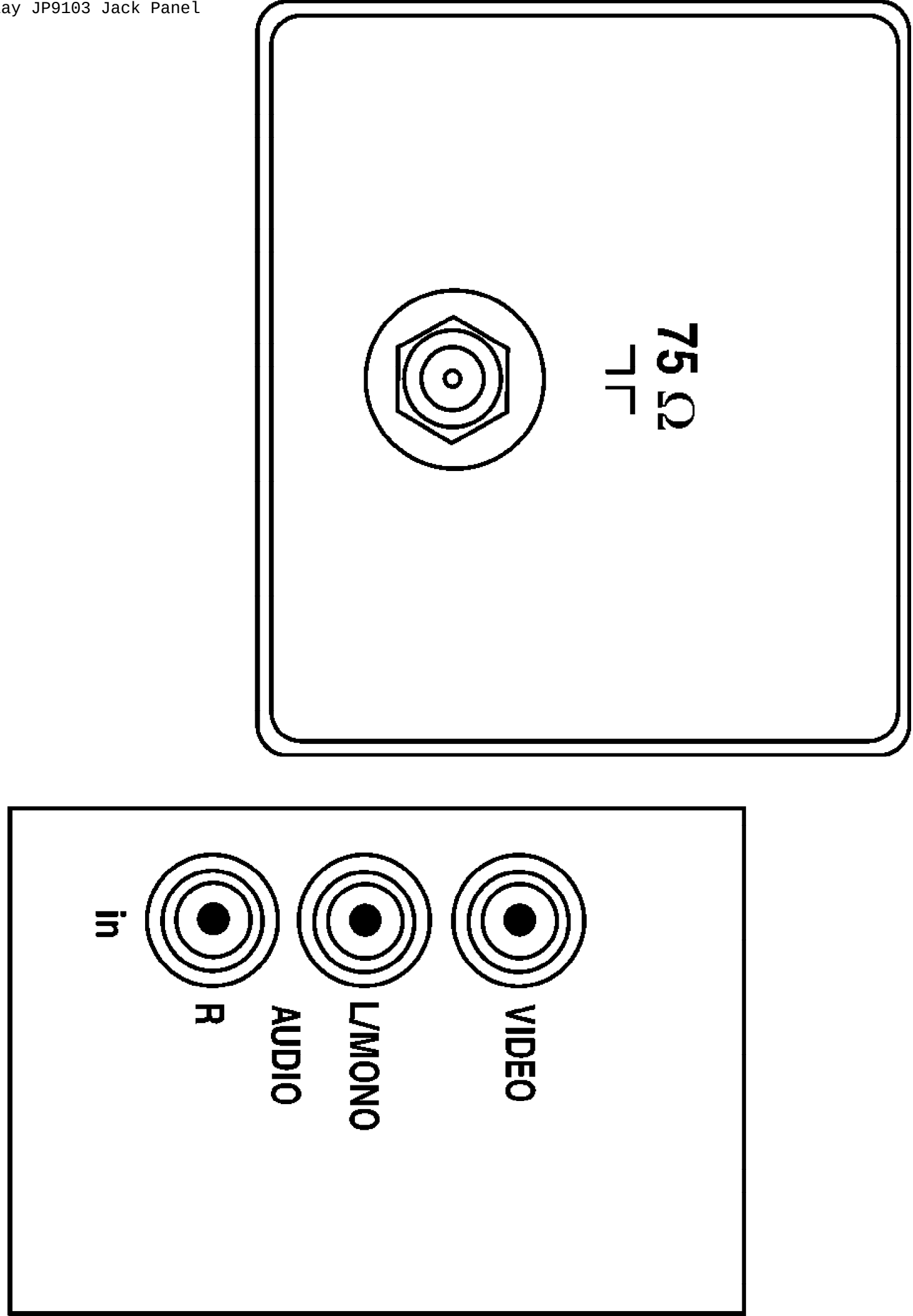
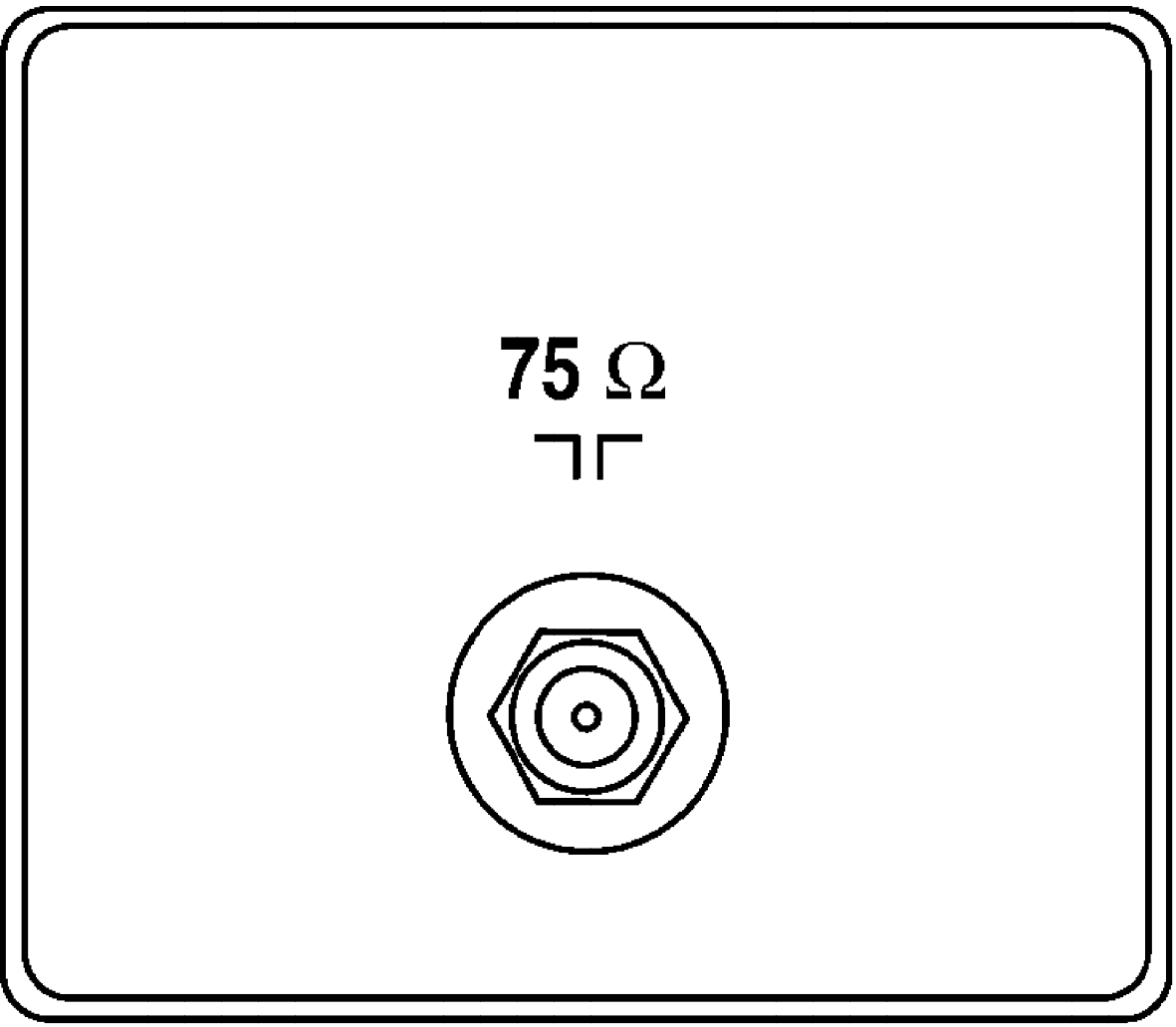
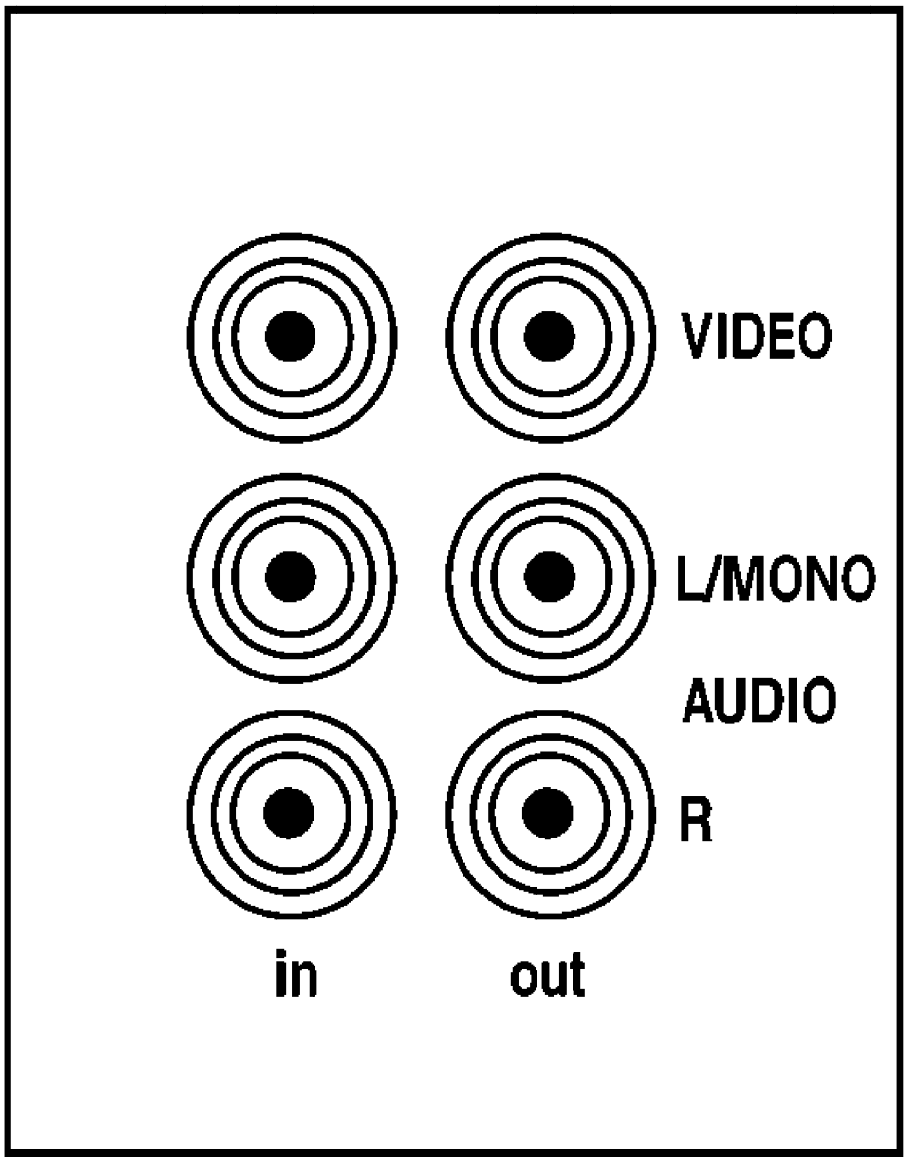
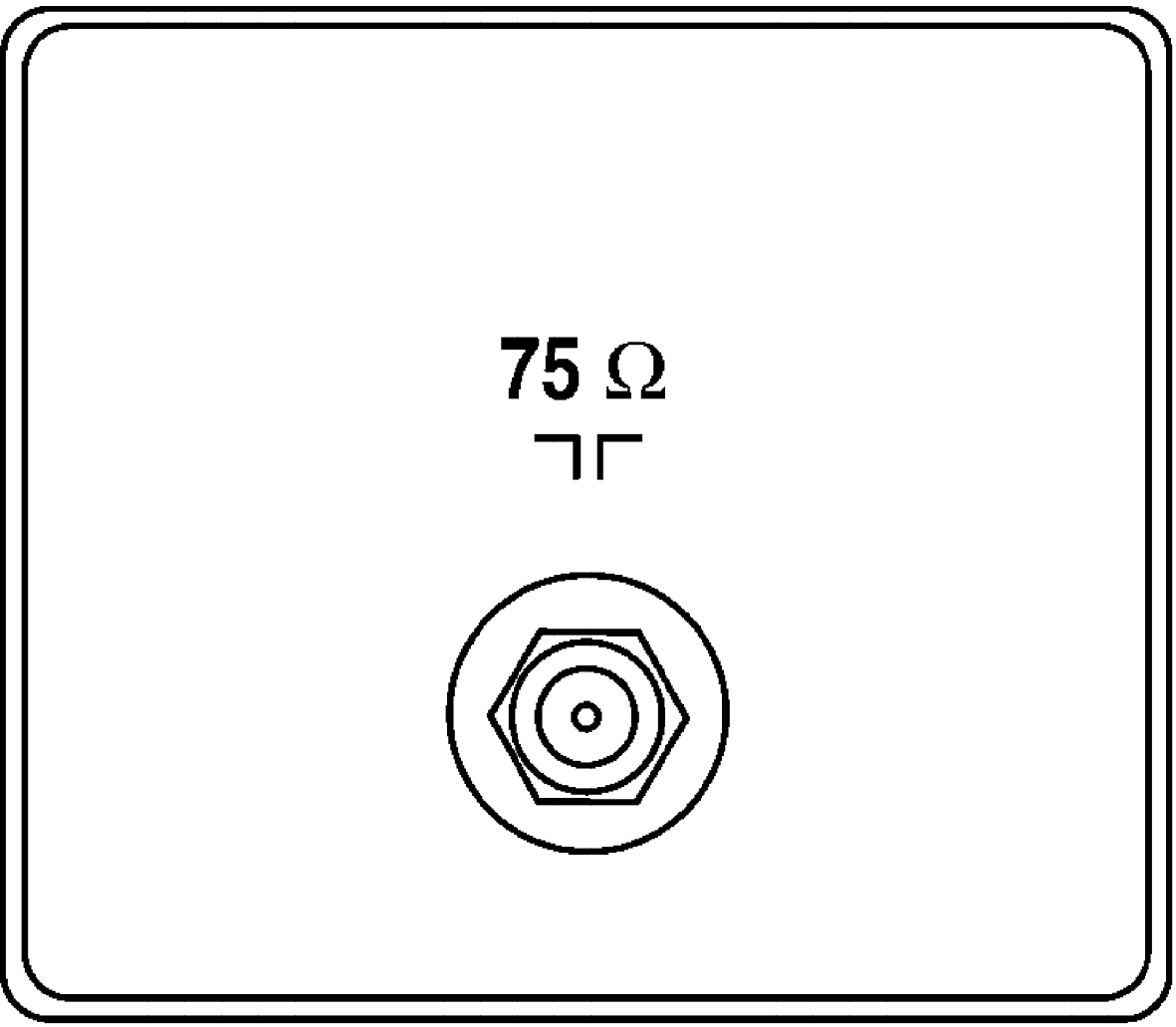
Display JP9103 Jack Panel

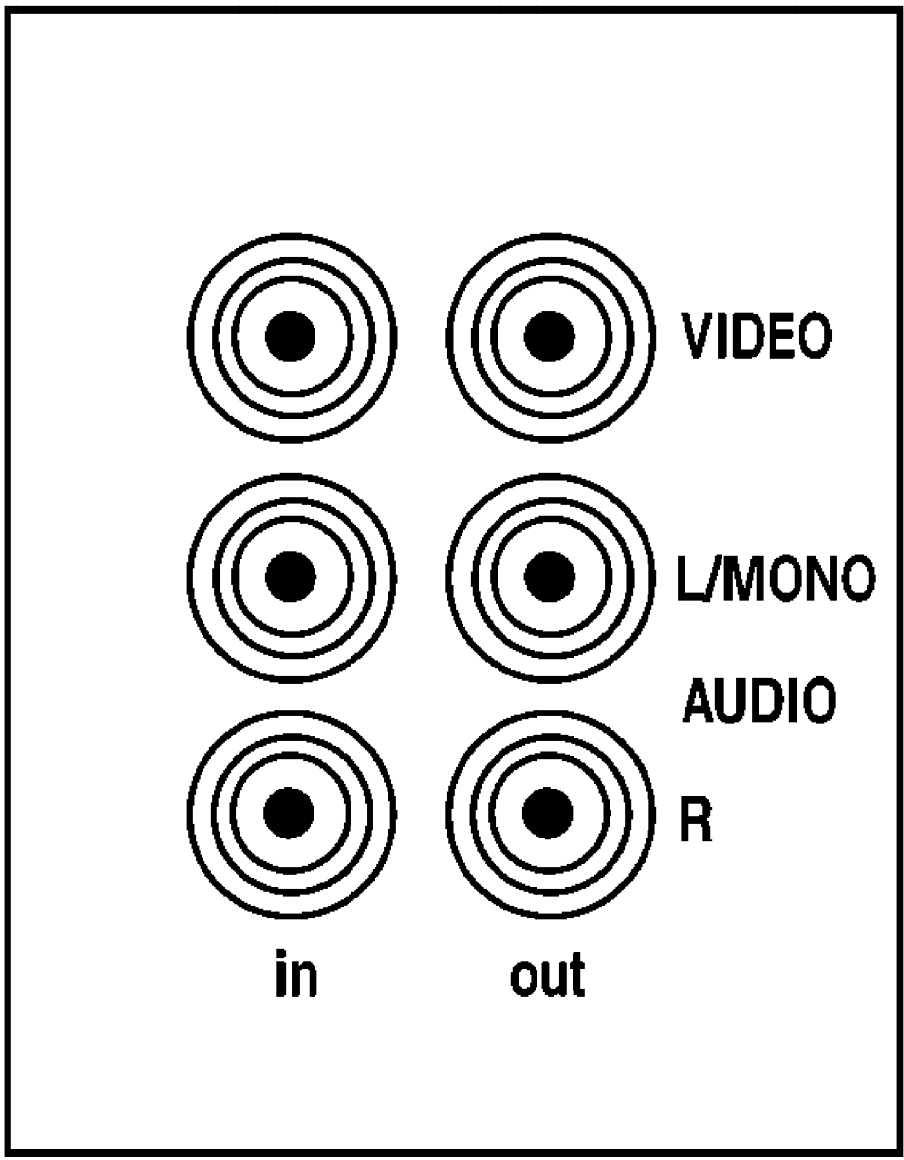






Display JP9106 Jack Panel





USA/CANADIAN CHASSIS LISTINGS

Philips Consumer Electronics

Technical Service Data

Service and Quality
Service Publications Dept.
One Philips Drive
P.O. Box 14810
Knoxville, TN 37914

Manual 7583
Model no.: 26LL590121
First Publish: 10-9-2000
Rev. Date: 08-02-2004
Print Date: 10/07/2006

Electrical Adjustments

REFER TO SAFETY GUIDELINES

SAFETY NOTICE: ANY PERSON ATTEMPTING TO SERVICE THIS CHASSIS MUST FAMILIARIZE HIMSELF WITH THE CHASSIS AND BE AWARE OF THE NECESSARY SAFETY PRECAUTIONS TO BE USED WHEN SERVICING ELECTRONIC EQUIPMENT CONTAINING HIGH VOLTAGES.

CAUTION: USE A SEPARATE ISOLATION TRANSFORMER FOR THIS UNIT WHEN SERVICING

SERVICE ADJUSTMENTS

Required Tools For Servicing:

Isolation Transformer
Multimeter
Oscilloscope
High Voltage (100:1) Oscilloscope Probe
Sencore VG91 Universal Video Generator

Service Adjustment Notes:

Unless Otherwise Specified:

1. All service adjustments are ”hot“ voltagewise. For maximum safety, ensure the use of properly insulated tools.
2. Refer to the F8 Main Chassis Printed Circuit Board for location of test points and adjustable components.
3. Grid Locations (Ex.: D-2) next to the reference numbers for components refer to the Main Chassis Printed Circuit Board.

Caution: The F8 chassis incorporates a ”hot“ ground system. Always use a separate isolation transformer when applying power to the exposed chassis.

Focus Adjustment

1. Tune the set to a local or cable station.
2. Adjust the Focus Control (located on the upper part of the flyback transformer) for best picture details at high light conditions.

Degaussing the Television

1. Position the television so that the screen faces the direction it will be facing when in use.
2. Ensure the set is turned off.
3. Move a degaussing coil in a circular motion slowly around the sides and front of the set.
4. Withdraw the degaussing coil at least six feet from the television before disconnecting it from its power source.

Service Modes:

Introduction

1. There are three service modes used in the F8 chassis. They are:
    a. SDM - Service Default Mode
    b. SAM - Service Alignment Mode
    c. CSM - Customer Service Mode
2. The Service Default Mode (SDM) is a technical aid for the service technician. It is used for setting of options, reading error codes, and erasing error codes. This mode displays the Run Timer, Software Version, and current option settings. Service Default Mode (SDM) also establishes a fixed, repeatable setting of controls to allow measurements to be made. On screen display is kept at a minimum to reduce the cluttering of waveforms with unwanted information.
3. The Service Alignment Mode (SAM) is used to make tuning adjustments, align the white tone, adjust the picture geometry, and make sound adjustments.
4. The Customer Service Mode shows error codes and information on the TV operation settings. The servicer can instruct the customer to enter CSM by

telephone and read off the information displayed. This helps the servicer to diagnose problems and failures in the TV set before making a service call.

5. When in a service mode, "SDM" (for Service Default Mode) or ”SAM“ (for Service Alignment Mode) or ”CSM“ (for Customer Service Mode) will be displayed (in green) in the top right corner of the screen. All other On Screen Display (except highlighted items in SDM or SAM) will be in red.
6. It will be memorized in the EEPROM that the TV set is in SDM or SAM. This is necessary because the TV must show up in SDM or SAM again after an AC power interrupt.
7. When the television is in SAM or SDM, all normal features (such as volume control and direct channel access) are available.

EEPROM Replacement or Defective EEPROM

After replacing a EEPROM (or with a defective/no EEPROM) default settings will be used that enable the set to start up and that allow access to the Service Default Mode and Service Alignment Mode.

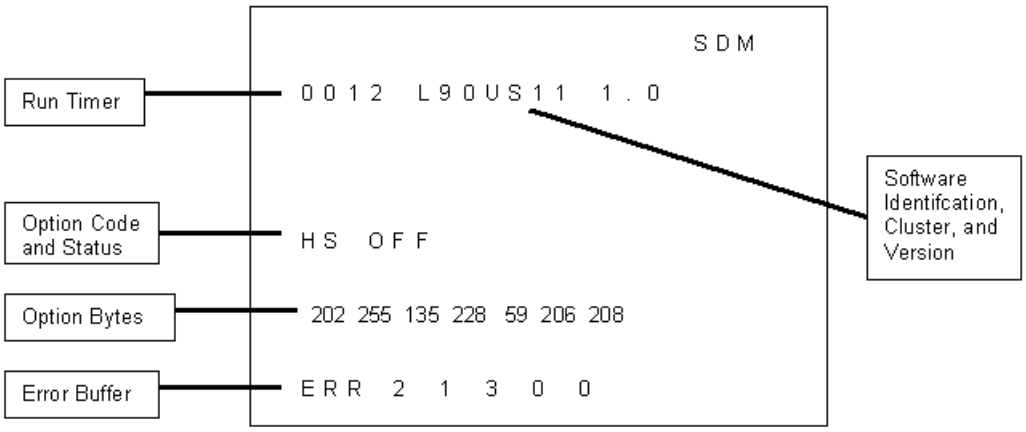
Service unfriendly modes

In the service modes, a number of modes/features are ignored since they interfere with diagnosing or repairing a set. These are ”service unfriendly modes.“
”Ignoring“ means that the event that is triggered is not executed; the setting remains unchanged (Example: Timer OFF: 8:00 PM; the set will not switch OFF in service mode at 8:00PM, but the setting will remain).
The service unfriendly modes are:

- (Sleep) timer
- Blue mute
- Auto switch off (when there is no video signal identified)
- Hotel or hospital mode
- Smart lock or blocking by V-chip
- Skipping and/or blanking of ”Not Favorite“ channels
- Automatic storing of Personal Preset settings
- Automatic user menu time-out (menu switches back or OFF automatically)

Service Default Mode (SDM)

1. The Service Default Mode (SDM), sets the option codes and bytes of the set, and displays the error codes (the Power LED begins blinking procedure for error code display, if errors are detected). SDM also overrides software protections.
   The Service Default Mode (SDM) must be used when taking voltages and waveforms.
2. To enter the Service Default Mode, press the following key sequence on the remote control transmitter:
   0-6-2-5-9-6-Menu
   Do not allow the display to time out between entries while keying the sequence.
   SDM can also be entered by pressing the Channel Down and Volume Down keys on the local keyboard simultaneously while in SAM mode.
   When Service Default Mode is entered, the text "SDM" will be displayed in the upper right corner of the screen.
3. When Service Default Mode is entered, the Power LED will begin blinking to display any detected error codes, the set automatically tunes to Channel 3 (61.25 MHz), and service unfriendly modes are disabled. All customer controls are set to predetermined values.
4. When the unit is operating in Service Default Mode, all normal on-screen displays are suppressed and replaced by a special service display. A sample SDM display is shown below.



5. To select an option code or option byte in SDM, use the Menu Up or Menu Down keys on the remote control.
6. To change the value of an option code, use the Menu Left or Menu Right keys.
7. To change the value of an option byte, enter the new value using the numeric keys on the remote control.
8. Press the Status button on the remote control to toggle the OSD (except ”SDM“) ON and OFF to prevent the OSD from interfering with measurements and oscilloscope waveforms.
9. Press the Menu button on the remote control while in SDM to switch the software to a Virtual Customer Mode; the text "SDM" will still be displayed in the upper right corner of the screen. In this mode, all customer menu adjustments to the set can be made. From the Virtual Customer Mode, press the Menu button to return to the SDM display.
10. To exit the Service Default Mode and erase the error codes, turn the unit off with the Power button on the remote control then unplug the AC cord.
11. To exit the Service Default Mode and save the error codes, unplug the AC cord to turn off the set. When the set is turned on again, the Service Default Mode will still be active.

Explanation of Display:

Run Timer

The run timer counts the normal operation hours, not the standby hours. The actual value of the run timer is displayed in SDM and CSM. The run timer displays hours in hexadecimal format. This display will increment based on the amount of time the set has been on. The timer will also be incremented one hour each time the set is turned on.

Software Identification, Cluster, and Version

The software identification, cluster, and version will be shown in the service main menu display.
These numbers consist of the last part of the customer identification printed on the IC package; the screen will show ”AAABBC-X.Y“. (Example: L90US11 1.0)

- AAA is the engineering project name (Ex: L90 = L9.0).
- BB is a function specification indicating specific functionality or a region (Ex: US). Processors with the same engineering project name and function name are interchangeable, except for the languages they support.
- C is the language cluster number within the ”BB“ software version

(Ex: 11 = English/Spanish/French)
- X is the main version number (Ex: 1)
- Y is the sub version number (Ex: 0)
- the main version number is updated with a major change of specification (incompatible with the previous software version)
- the sub version number is updated with a minor change (backwards compatible with the previous versions)
- if the main version number changes, the new version number is written in the EEPROM
- if the main version number changes, the default settings are loaded
- if the sub version number changes, the new version number is written in the EEPROM
- if the EEPROM is fresh, the software identification, version and cluster will be written to EEPROM
- **Note:** a new micro controller is considered to be compatible if it works instead of the old software and the functionality is not significantly changed.

Error Buffer

Error codes are required to indicate failures in the television. For intermittent complaints, always check the error buffer. A unique error code is available for:

- activated protection (error codes 1, 2, and 3)
- failing I^2C device
- general I^2C error
- RAM failure (e.g. internal RAM of microprocessor (IC 7600)

Other error codes are:

- Signal processor (IC 7250) start-up error
- EEPROM check-sum error

The last five errors, remembered in the EEPROM, are shown in the service menu. This is called the error buffer. The error that is found last is displayed on the left, except when protection (1 to 3) is active. Errors 1, 2, and 3 are often shown at the right of the error buffer display whenever they are detected.

Example 1:
Suppose the display shows: 8 – 11 – 2– 0 – 0
With 2 displayed at the right of the error buffer, high beam current protection is active.
Example 2:
Suppose the display shows: 11 – 4 – 5– 3 – 0
With 3 displayed at the right of the error buffer, vertical protection is active.

The following error codes have been defined:

Error Code Table:

0	= No error
1	= X-Ray / overvoltage protection active
2	= High beam current (BCI) protection active
3	= Vertical protection active
4	= I^2C error while communicating with the sound processor (IC 7833)
5	= Signal processor (IC 7250) start-up error
6	= I^2C error while communicating with the signal processor IC (IC 7250)
7	= General I^2C error *****
8	= Internal RAM error micro controller
9	= EEPROM Configuration error (Checksum error)

10 = I²C error, EEPROM error
11 = I²C error, PLL tuner

Note: I²C = (SCL/SDA)

* General I²C error means: no I²C device is responding to the particular I²C bus. Possible causes: SCL short circuit to GND, SDA short circuit to GND, SCL short circuit to SDA, SDA open circuit (at IC 7600), SCL open circuit (at IC 7600)

Reading Error Codes

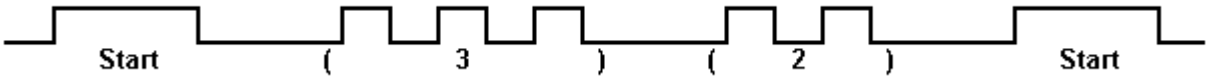
Error codes are displayed in the following ways:

1. By SDM display or CSM display
2. By blinking Power LED

1. If the on screen display is working, enter SDM or CSM and read the error buffer display.
2. If the on screen display is **not** working, do the following:
   a. Remove AC power
   b. Use a jumper to connect pin M24 to pin M25 at IC 7601 (D-3)
   c. Apply AC power; read the error codes (see LED Sequence List below)
   d. If there is no LED indication, take the following steps as needed:
      Power on
      Press 0–6–2–5–9–6–Menu on the remote control

   Note: Some indications take 30 seconds or longer to appear on the LED.
3. LED Sequence List:
   a. Wait for long LED on (1.5 seconds)
   b. Count the following on flashes (individual errors are separated by 1.5 seconds LED off)

   Example:



4. Displayed error codes are saved by removing the AC power. Displayed error codes are erased by pressing the power button on the remote control or local keyboard.

Option Code and Status Table

The following options in SDM can be identified:
Note: All options may not be available in some sets.

OPTION	OP	VALUES
System	SY	SS (This option is not used in US models)
Option Byte 1 Option Byte 2 Option Byte 3 Option Byte 4 Option Byte 5 Option Byte 6 Option Byte 7	OB1 OB2 OB3 OB4 OB5 OB6 OB7	Option Bytes 1 through 7 are used to set 8 options simultaneously with one byte (value can be keyed in with numerical buttons on remote control when the byte is highlighted). Values = 0 – 255 See the Chassis Feature Listing to see the values for Option Bytes 1 through 7. These values can be used to set the option package for a particular model.
Slider Bar Value Display	DP	OFF/ON
Animated Menu	AM	OFF/ON
Hospital Mode	HS	OFF/ON
Hotel Mode	HT	OFF/ON

Demo Mode	DM	OFF/ON
Games Mode	GM	OFF/ON
Clock (Volatile)	CK	OFF/ON
Child Lock	CL	OFF/ON
V-Chip	VC	OFF/ON
V-Chip Block Unrated	VU	OFF/ON
Block No Rating (V-Chip)	VN	OFF/ON
Smart Sound	SS	OFF/ON
Smart Picture	SP	OFF/ON
Remote Control Type	RC	OFF = RC0702/04 remote control / ON = All other remote controls
Channel Select Time Window	TW	OFF = 2-second time window / ON = 5-second time window
Surf	SF	OFF/ON
Video Mute (Channel Change)	VM	OFF/ON
Tuner Type	TN	OFF = Philips tuner / ON= ALPS tuner
Fine Tuning	FT	OFF/ON
AV1	XT	OFF/ON
AV2	2X	OFF/ON
Auto Cable Detect	CD	OFF/ON
Blue Mute	BM	OFF/ON
No Ident (Auto Standby)	NI	OFF/ON
Noise Reduction	NR	OFF/ON
Contrast Plus	CP	OFF/ON
Color Temperature	CT	OFF/ON
East-West Functions	EW	OFF/ON (This option is not used in US models)
Video Processor Standby	BS	OFF/ON
Video Processor Auto Startup	AS	OFF/ON
Bass/Treble Control/Boost	BT	OFF/ON
Incredible Surround	IS	OFF/ON
Volume Limiter	VL	OFF/ON
Ultra Bass	UB	OFF/ON
Automatic Volume Leveller (AVL)	LV	OFF/ON
SAP - Mono/Stereo	DU	OFF/ON
Audio Out (Fixed/Variable)	AO	OFF/ON
Sound Type	ST	BG/I/DK/M (Should remain on M)
Sound Board	SB	DB = DBX/SAP (BTSC) EC = BTSC stereo (No SAP) MA = Mono All MS = Bi Sonic (Mono by tuner, stereo by A/V jacks)

Option SY : System

Function: Set the multi system hardware configuration
Values: SS (This option is not used in US models)

OB 1 – OB 7 : Option Byte 1 – Option Byte 7

Function: Set 8 options simultaneously with one byte
(value can be keyed in with numerical buttons on remote control)
Values: 0 – 255

Option DP : Slider Bar Value Display

Function: Enable/disable slider bar value display in customer menu
Values: OFF = Disable slider bar value display
ON = Enable slider bar value display

Option AM : Animated Menu

Function: Enable/disable animated menu
Values: OFF = Disable animated menu display

ON = Enable animated menu display

Option HS : Hospital Mode

Function: Enable/disable the possibility to enter hospital mode

Values: OFF = Disabled, hospital mode cannot be entered

ON = Enabled, hospital mode can be entered

Option HT : Hotel Mode

Function: Enable/disable the possibility to enter hotel mode

Values: OFF = Disabled, hotel mode cannot be entered

ON = Enabled, hotel mode can be entered

Option DM : Demo Mode

Function: Enable/disable the possibility to enter demo mode

Values: OFF = Disabled, demo mode is not active

ON = Enabled, demo mode is active

Option GM : Games Mode

Function: Enable/disable games function

Values: OFF = Disabled, games command is ignored

ON = Enabled, games command is processed

Option CK : Clock (Volatile)

Function: Enable/disable clock function

Values: OFF = Disabled, clock menu not available

ON = Enabled, clock menu available

Option CL : Child Lock

Function: Enable/disable child lock function

Values: OFF = Disabled, child lock menu not available

ON = Enabled, child lock menu available

Option VC : V-Chip

Function: Enable/disable v-chip function (customer menu item Smartlock)

Values: OFF = Disabled, v-chip menu (customer menu item Smartlock) Not available

ON = Enabled, v-chip menu (customer menu item Smartlock) available

Option VU : V-Chip Block Unrated

Function: Enable/disable V-Chip block unrated (in Smartlock menu)

Values: OFF = Disabled, V-Chip block unrated (in Smartlock menu) not available

ON = Enabled, V-Chip block unrated (in Smartlock menu) available

Option VN : Block No Rating (V-Chip)

Function: Enable/disable block no rating V-Chip (in Smartlock menu)

Values: OFF = Disabled, block no rating V-Chip (in Smartlock menu) not available

ON = Enabled, block no rating V-Chip (in Smartlock menu) available

Option SS : Smart Sound

Function: Enable/disable smart sound function

Values: OFF = Disabled, Smart Sound command is ignored

ON = Enabled, Smart Sound command is processed

Option SP : Smart Picture

Function: Enable/disable smart picture function

Values: OFF = Disabled, Smart Picture command is ignored

ON = Enabled, Smart Picture command is processed

Option RC : Remote Control Type

Function: Choose the type of remote control to be used

Values: OFF = RC0702/04 remote control

ON = All other remote controls

Note: If changed, this option can only be returned to the original setting by option byte correction.

Option TW : Channel Select Time Window

Function: Select time window for channel selection

Values: OFF = 2-second time window for channel selection
ON = 5-second time window for channel selection

Option SF : Surf

Function: Enable/disable the possibility to enter surf mode

Values: OFF = Disabled, customer menu item Surf not available and A/CH command alternates channels
ON = Enabled, customer menu item Surf available and A/CH command surfs or alternates channels

Option VM : Video Mute (Channel Change)

Function: Enable/disable video mute during channel change

Values: OFF = Disabled, no video mute during channel change
ON = Enabled, video muted during channel change

Option TN : Tuner Type

Function: Choose the tuner type that is configured in the hardware

Values: OFF = Philips tuner (A Philips tuner will have the Philips name embossed on the side)
ON = ALPS tuner (An ALPS tuner will **not** have the Philips name embossed on the side)

Option FT : Fine Tuning

Function: Enable/disable fine tuning

Values: OFF = Customer menu item fine tuning disabled
ON = Customer menu item fine tuning enabled

Option XT : AV1

Function: Enable/disable external input source 1 (Ext 1)

Values: OFF = Disabled, external input source 1 (Ext 1) not available
ON = Enabled, external input source 1 (Ext 1) available

Option 2X : AV2

Function: Enable/disable external input source 2 (Ext 2)

Values: OFF = Disabled, external input source 2 (Ext 2) not available
ON = Enabled, external input source 2 (Ext 2) available

Option CD : Auto Cable Detect

Function: Enable/disable automatic detection of Cable/Broadcast during autostore.

Values: OFF = Disabled, autostore uses the selected Cable/Broadcast setting
ON = Enabled, autostore will detect and set Cable/Broadcast mode

Option BM : Blue Mute

Function: Enable/disable blue mute when no television station signal is present

Values: OFF = Disabled, no blue mute when no television station signal is present
ON = Enabled, blue mute active when no television station signal is present

Option NI : No Ident (Auto Standby)

Function: Enable/disable automatic switch to standby after 10 minutes when no television station signal is present

Values: OFF = Disabled, no automatic switch to standby
ON = Enabled, set switches to standby after 10 minutes when no television station signal is present

Option NR : Noise Reduction

Function: Enable/disable noise reduction function

Values: OFF = Disabled, customer menu item Noise Reduction not available
ON = Enabled, customer menu item Noise Reduction available

Option CP : Contrast Plus

Function: Enable/disable contrast plus function

Values: OFF = Disabled, customer menu item Contrast Plus not available
ON = Enabled, customer menu item Contrast Plus available

Option CT : Color Temperature

Function: Enable/disable color temperature function

Values: OFF = Disabled, customer menu item Color Temperature not available
ON = Enabled, customer menu item Color Temperature available

Option EW : East-West Functions

Function: Enable/disable east-west control function

Values: OFF = Disabled, east-west alignment not available in SAM (EWW, EWP, EWC, EWT)
ON = Enabled, east-west alignment available in SAM (EWW, EWP, EWC, EWT)

Option BS : Video Processor Standby

Function: Enable/disable video processor standby

Values: OFF = Disabled, video processor standby is not active
ON = Enabled, video processor standby is active

Option AS : Video Processor Auto Startup

Function: Enable/disable video processor auto-startup

Values: OFF = Enabled, video processor is in auto-startup mode
ON = Disabled, video processor is switched on under control of microcontroller

Option BT : Bass/Treble Control/Boost

Function: Enable/disable bass and treble function

Values: OFF = Disabled, customer menu items Bass and Treble not available
ON = Enabled, customer menu items Bass and Treble available

Option IS : Incredible Surround

Function: Enable/disable incredible surround function

Values: OFF = Disabled, incredible surround function not available
ON = Enabled, incredible surround function available

Option VL : Volume limiter

Function: Enable/disable volume limiter

Values: OFF = Disabled, customer menu item Volume Limiter not available
ON = Enabled, customer menu item Volume Limiter available

Option UB : Ultra Bass

Function: Enable/disable ultra bass function

Values: OFF = Disabled, ultra bass function not available
ON = Enabled, ultra bass function available

Option LV : Automatic Volume Leveller (AVL)

Function: Enable/disable automatic volume leveller function

Values: OFF = Disabled, customer menu item AVL not available
ON = Enabled, customer menu item AVL available

Option DU : SAP

Function: Set SAP configuration (sets with DBX stereo system only)

Values: OFF = Disabled, stereo/SAP not available
ON = Enabled, stereo/SAP available

Option AO : Audio Out (Fixed/Variable)

Function: Set audio output type (where present)

Values: OFF = Fixed audio out
ON = Variable audio out (always on)

Option ST : Sound Type

Function: Set the sound type

Values: BG PAL system
I PAL system
DK PAL system
M Default for USA

Option SB : Sound Board

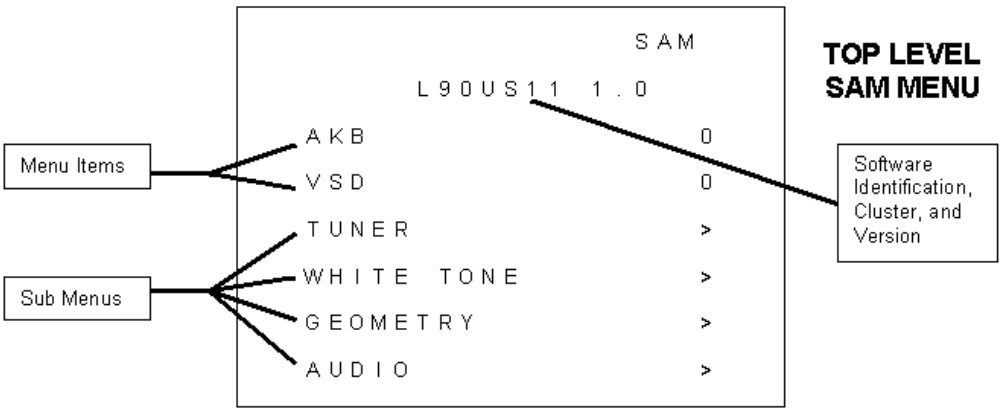
Function: Set the sound board configuration

Values: DB = DBX/SAP (BTSC)
EC = BTSC stereo (No SAP)

MA = Mono All
MS = BiSonic (Mono from tuner, Stereo from A/V jacks)

Service Alignment Mode (SAM)

1. The Service Alignment Mode (SAM) is used to make tuning adjustments, align the white tone, adjust the picture geometry, and make sound adjustments.
2. To enter the Service Alignment Mode (SAM), press the following key sequence on the remote control transmitter:
   0-6-2-5-9-6-Status
   Do not allow the display to time out between entries while keying the sequence. SAM can also be entered by pressing the Channel Down and Volume Down keys on the local keyboard simultaneously while in SDM mode.
   When Service Alignment Mode is entered, the text "SAM" will be displayed in the top right corner of the screen.
3. When Service Alignment Mode is entered, service unfriendly modes are disabled. The following volatile SAM item values are set:
   - AKB = 0
   - VSD = 0
   - AFW = 275 kHz
   - SBL = 0
4. When the unit is operating in Service Alignment Mode, all normal on-screen displays are suppressed and replaced by a special service display. The first screen seen upon entering SAM is the ”top level SAM menu.“ The service technician must return to the top level SAM menu before exiting with a power-off command.
   A sample SAM top level menu display is shown below.



Explanation of top level SAM menu display:
The Software Identification, Cluster, and Version are explained in the Service Default Mode section under ”Explanation of Display.“
The Menu Items and Sub Menus are explained below.
Note: The ”Audio“ sub menu will not be seen on screen when Service Alignment Mode is first entered. Use the Menu Up and Menu Down buttons on the remote control to view all menu items and sub menu choices.

5. To select a menu item or a sub menu in SAM, use the Menu Up or Menu Down keys on the remote control to highlight the item or menu you wish to adjust.
6. To change the value of a highlighted SAM menu item (AKB or VSD), use the Menu Left or Menu Right keys on the remote control.

7. To enter a highlighted SAM sub menu, use the Menu Left or Menu Right keys. After entering the sub menu, use the Menu Up or Menu Down to select an item within the sub menu.
   Use the Menu Left or Menu Right keys to change the value of the selected item.
   Press the Menu button to return to the top level SAM menu.
8. Press the Menu button on the remote control while in SAM to switch the software to a Virtual Customer Mode; the text "SAM" will still be displayed in the upper right corner of the screen. In this mode, all customer menu adjustments to the set can be made. From the Virtual Customer Mode, press the Menu button to return to the SAM Menu.
9. Press the Status button on the remote control to toggle the OSD (except ”SAM“) ON and OFF.
10. To exit the Service Alignment Mode, turn the set off with the Power button on the remote control. To turn off the set without exiting SAM (or erasing any stored error codes), unplug the AC cord. When the set is powered on again, the Service Alignment Mode will still be active.
    Note: When SAM is exited or a power interrupt occurs, the volatile SAM items AKB, VSD, AFW, and SBL will be reset to their original values.

Main Menu

The SAM main menu contains the following items:

- AKB
- VSD
- Tuner sub menu
- White Tone sub menu
- Geometry sub menu
- Audio sub menu

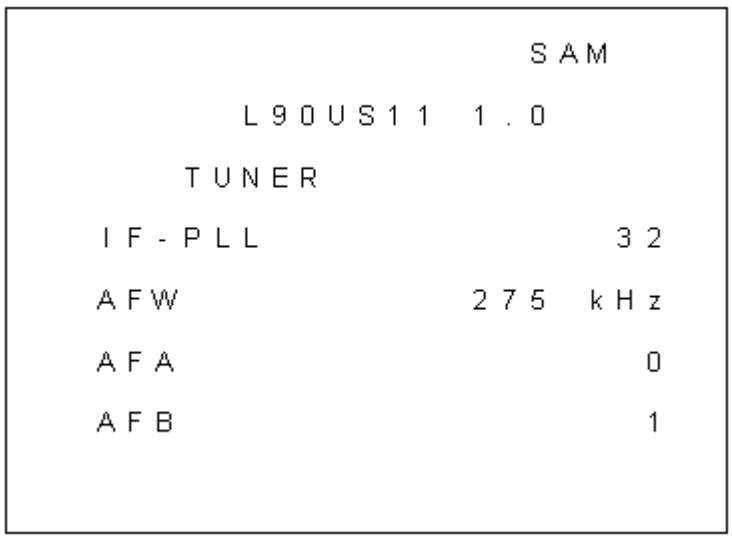
Menu: **MAIN**		**Values**	**Remarks**
AKB	Black current loop (Auto Kine Bias)	OFF/ON (0/1)	
VSD	Vertical scan disable	OFF/ON (0/1)	
TUNER		**>**	
WHITE TONE		**>**	
GEOMETRY		**>**	
AUDIO		**>**	

Tuner sub menu

The tuner sub menu contains the following items:

- IF-PLL
- AFW
- AGC
- YD
- CL
- AFA and AFB

The items AFA and AFB cannot be selected; they are for monitoring purposes only.
The item values are stored in EEPROM if this sub menu is left.
A sample display of the Tuner sub menu is shown below.



Sub Menu: **TUNER**		**Values**	**Remarks**
IF-PLL	IF-PLL alignment	0 – 127	This adjustment is auto-aligned (no action required)
AFW	AFC window	1 2 5 / 2 7 5 kHz	Always set to 275 kHz
AGC	AGC takeover point	0 – 63	See below
YD	Y-delay adjustment	0 – 15	Always set to 12 (no effect)
CL	Cathode drive level	0 – 7	Always set to 4
AFA		0 / 1	read only, not accessible
AFB		0 / 1	read only, not accessible

Tuner Adjustment:

AGC Takeover Point (AGC):

1. Enter the Service Alignment Mode (SAM) by pressing the following key sequence on the remote control transmitter:
   0-6-2-5-9-6-Status
   Do not allow the display to time out between entries while keying the sequence.
2. From the top level SAM menu, use the Menu Up/Down keys to highlight the Tuner sub menu.
3. Use the menu left/right keys to enter the Tuner sub menu.
4. In the Tuner sub menu, use the Menu Up/Down keys to highlight AGC.
5. Use the Menu Right key to raise the value of AGC until snow appears in the picture.
6. Then use the Menu Left/Right keys to reduce AGC value until the snow disappears.
   a. AGC values between 10 and 20 are nominal.
   b. Single digit AGC values may cause overload.
7. Upon completion of Tuner adjustment, press the Menu button to return to the top

level SAM menu.

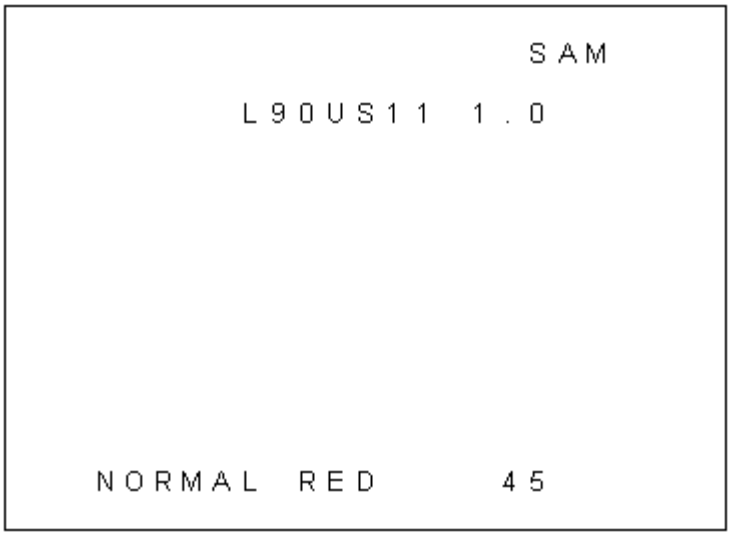
White Tone sub menu

The white tone sub menu contains the following items:

- Normal Red
- Normal Green
- Normal Blue
- Delta Cool Red
- Delta Cool Green
- Delta Cool Blue
- Delta Warm Red
- Delta Warm Green
- Delta Warm Blue

Note: Delta values are only used in models with the item ”Color Temperature“ in the customer menu.

OSD is kept to a minimum in this menu, in order to make white tone alignment possible.
The item values are stored in EEPROM if this sub menu is left.
The Contrast Plus feature (black stretch) is set to OFF when the White Tone sub menu is entered.
A sample display of the White Tone sub menu is shown below.



Sub Menu: **WHITE TONE**		**Value Range**	**Remarks**
NORMAL			Starting Values:
	NORMAL RED	0 – 63	45
	NORMAL GREEN	0 – 63	32
	NORMAL BLUE	0 – 63	39
COOL		**Default Value**	
	DELTA COOL RED	–2	Delta values are a change of the normal values. These start at the default values, and are set to

	DELTA COOL RED	–2	Delta values are a change of the normal values. These start at the default values, and are set to achieve cool and warm steps of color temperature in the customer menu. Standard factory settings are given as the default values.
	DELTA COOL GREEN	0	
	DELTA COOL BLUE	+6	
WARM			
	DELTA WARM RED	+2	
	DELTA WARM GREEN	0	
	DELTA WARM BLUE	–7	

White Tone Adjustments:

Note: The following procedure was performed with a Sencore VG91 Universal Video Generator providing grey scale bars.

1. Enter the Service Alignment Mode (SAM) by pressing the following key sequence on the remote control transmitter:
   0-6-2-5-9-6-Status
   Do not allow the display to time out between entries while keying the sequence.
2. From the top level SAM menu, use the Menu Up/Down keys to highlight the White Tone sub menu.
3. Use the Menu Left/Right keys to enter the White Tone sub menu.
4. Set the VG91 Generator as follows: STD TV Ch. 3, RF-IF Range set to HI, RF-IF Level set to NORMAL (1), Video Pattern = Raster, R-G-B raster controls OFF.
5. Connect the RF output of the generator to the Television Antenna Input, and adjust the VG91 level to remove any snow from the raster.
6. Turn off chroma at generator and leave grey scale bars.
7. From the White Tone sub-menu, use the Menu Up/Down keys to select Normal Red, Normal Green, or Normal Blue. Then use the Menu Left/Right keys to adjust the values to obtain the best white balance.
8. A reasonable starting point for NORMAL is:
   Normal Red=45, Normal Green=32, Normal Blue=39
9. After NORMAL is set, use the same method to set DELTA COOL and DELTA WARM as offsets.
   A reasonable starting point for DELTA COOL is:
   Delta Cool Red=(–2), Delta Cool Green=0, Delta Cool Blue=+6
   A reasonable starting point for DELTA WARM is:
   Delta Warm Red=+2, Delta Warm Green=0, Delta Warm Blue=(-7)
10. After the values are set, or if no changes are required, press Menu to return to the top level SAM menu.

Geometry sub menu

OSD is kept to a minimum in this sub menu in order to make picture geometry adjustments possible.
The item values are stored in EEPROM if this sub menu is left.
The value of item Service Blanking (SBL) is not stored in EEPROM, and it is set to OFF when the geometry sub menu is exited.
A sample display of the Geometry sub menu is shown below.

The picture geometry sub menu contains the following items:

Sub Menu:	GEOMETRY	Values	Remarks
VAM	Vertical amplitude	0 – 63	
VSL	Vertical slope	0 – 63	
SBL	Service blanking	ON/OFF	
HSH	Horizontal shift	0 – 63	
EWW	E-W width	0 – 63	Only available in models with an East-West Panel (Diode Modulator)
EWP	E-W parabola/width	0 – 63	Only available in models with an East-West Panel (Diode Modulator)
EWT	E-W trapezium	0 – 63	Only available in models with an East-West Panel (Diode Modulator)
EWC	E-W corner parabola	0 – 63	Only available in models with an East-West Panel (Diode Modulator)
H60	Delta HSH for 60 Hz	0 – 15	Not used
V60	Delta VAM for 60 Hz	0 – 15	Not used
VSC	Vertical S-Correction	0 – 63	
VSH	Vertical shift	0 – 63	

Geometry Adjustments:

Notes:
1. The following Geometry adjustments were performed with a Sencore VG91 Universal Video Generator.
2. Set the VG91 Generator as follows: STD TV Ch. 3, RF-IF Range set to HI, RF-IF Level set to NORMAL (1), Video Pattern = Raster, R-G-B raster controls OFF, crosshatch or center cross pattern as required.
3. Connect the RF output of the generator to the Television Antenna Input, and adjust the VG91 level to remove any snow from the raster.

Vertical Shift (VSH):

1. Enter the Service Alignment Mode (SAM) by pressing the following key sequence on the remote control transmitter:
   0-6-2-5-9-6-Status
   Do not allow the display to time out between entries while keying the sequence.
2. From the top level SAM menu, use the Menu Up/Down keys to highlight the Geometry sub menu.
3. Use the Menu Left/Right keys to enter the Geometry sub menu.
4. In the Geometry sub-menu, use the Menu Up/Down keys to select VAM.
5. Input a center cross pattern to the antenna/cable input terminal.
6. Using the Menu Left/Right keys, adjust VSH so that the horizontal bar is properly centered, top to bottom.
7. If other Geometry adjustments are needed, proceed to the necessary adjustment using the Menu Up/Down buttons.
8. Upon completion of Geometry adjustments, press the Menu button to return to the top level SAM menu.

Vertical Amplitude (VAM):

1. Enter the Service Alignment Mode (SAM) by pressing the following key sequence on the remote control transmitter:
   0-6-2-5-9-6-Status
   Do not allow the display to time out between entries while keying the sequence.
2. From the top level SAM menu, use the Menu Up/Down keys to highlight the Geometry sub menu.
3. Use the Menu Left/Right keys to enter the Geometry sub menu.
4. In the Geometry sub-menu, use the Menu Up/Down keys to select VAM.
5. Input a crosshatch pattern to the antenna/cable input terminal.
6. Using the Menu Left button, reduce the value so that the picture does not fill the entire screen.
7. Use the Menu Up/Down keys to select VSH (Vertical Shift) from the Geometry sub-menu and, using the Menu Left/Right keys, center the picture on the screen, top to bottom.
8. Using the cursor up/down keys, select VAM from the Geometry sub-menu, and use the Menu Right key to increase the value to obtain a slight overscan.
9. If other Geometry adjustments are needed, proceed to the necessary adjustment using the Menu Up/Down buttons.
10. Upon completion of Geometry adjustments, press the Menu button to return to the top level SAM menu.

Horizontal Shift (HSH):

Note: This adjustment centers the video on the raster. It does not move the raster.

1. Enter the Service Alignment Mode (SAM) by pressing the following key sequence on the remote control transmitter:
   0-6-2-5-9-6-Status
   Do not allow the display to time out between entries while keying the sequence.
2. From the top level SAM menu, use the Menu Up/Down keys to highlight the Geometry sub menu.
3. Use the Menu Left/Right keys to enter the Geometry sub menu.
4. In the Geometry sub-menu, use the Menu Up/Down keys to select HSH.
5. Input a center cross pattern to the antenna/cable input terminal.
6. Using the Menu Left/Right keys, adjust HSH so that the vertical bar is properly centered, left to right.
7. If other Geometry adjustments are needed, proceed to the necessary adjustment using the Menu Up/Down keys.
8. Upon completion of Geometry adjustments, press the Menu button to return to the top level SAM menu.

Vertical Slope (VSL):

1. Enter the Service Alignment Mode (SAM) by pressing the following key sequence on the remote control transmitter:
   0-6-2-5-9-6-Status
   Do not allow the display to time out between entries while keying the sequence.
2. From the top level SAM menu, use the Menu Up/Down keys to highlight the Geometry sub menu.
3. Use the Menu Left/Right keys to enter the Geometry sub menu.
4. In the Geometry sub-menu, use the Menu Up/Down keys to select VSL.
5. Input a crosshatch pattern to the antenna/cable input terminal.
6. Using the Menu Left/Right keys, adjust VSL so that the squares at the bottom of the screen are equal in size to the squares at the top of the screen.
7. If other Geometry adjustments are needed, proceed to the necessary adjustment using the Menu Up/Down keys.
8. Upon completion of Geometry adjustments, press the Menu button to return to the top level SAM menu.

Vertical S-Correction (VSC):

1. Enter the Service Alignment Mode (SAM) by pressing the following key sequence on the remote control transmitter:
   0-6-2-5-9-6-Status
   Do not allow the display to time out between entries while keying the sequence.
2. From the top level SAM menu, use the Menu Up/Down keys to highlight the Geometry sub menu.
3. Use the Menu Left/Right keys to enter the Geometry sub menu.
4. In the Geometry sub-menu, use the Menu Up/Down keys to select VSC.
5. Input a crosshatch pattern to the antenna/cable input terminal.
6. Using the Menu Left/Right keys, adjust VSC so that the squares at the center of the screen are equal in size to the squares at the top and bottom of the screen.
7. If other Geometry adjustments are needed, proceed to the necessary adjustment using the Menu Up/Down keys.
8. Upon completion of Geometry adjustments, press the Menu button to return to the top level SAM menu.

Service Blanking (SBL):

Service Blanking provides a straight cutoff line in the center of the raster. It is useful when centering the raster. It can also be used in adjusting the yoke and setting vertical size and linearity.

1. Enter the Service Alignment Mode (SAM) by pressing the following key sequence on the remote control transmitter:
   0-6-2-5-9-6-Status
   Do not allow the display to time out between entries while keying the sequence.
2. From the top level SAM menu, use the Menu Up/Down keys to highlight the Geometry sub menu.
3. Use the Menu Left/Right keys to enter the Geometry sub menu.
4. In the Geometry sub-menu, use the Menu Up/Down keys to select SBL.
5. Use the Menu Left/Right keys to toggle SBL ON or OFF.
6. With SBL on, VSH can be used to center the raster on the fiduciary marks (the small notches in the phosphor on the right and left edge of the CRT). These are absolute center.
7. If other Geometry adjustments are needed, proceed to the necessary adjustment using the Menu Up/Down keys.
8. Upon completion of Geometry adjustments, press the Menu button to return to

the top level SAM menu.

Delta HSH for 60Hz (H60):

Note: This adjustment should not be changed from the factory preset value (10).

Delta VAM for 60Hz (V60):

Note: This adjustment should not be changed from the factory preset value (5).

Note: The following GEOMETRY adjustments can only be performed on models containing an East-West Panel (Diode Modulator).

East-West Width (EWW):

1. Enter the Service Alignment Mode (SAM) by pressing the following key sequence on the remote control transmitter:
   0-6-2-5-9-6-Status
   Do not allow the display to time out between entries while keying the sequence.
2. From the top level SAM menu, use the Menu Up/Down keys to highlight the Geometry sub menu.
3. Use the Menu Left/Right keys to enter the Geometry sub menu.
4. In the Geometry sub menu, use the Menu Up/Down keys to select EWW.
5. Input a crosshatch pattern to the antenna/cable input terminal.
6. Use the Menu Left key to reduce the value of EWW so that the picture does not fill the entire screen.
7. Use the Menu Up/Down keys to select HSH (Horizontal Shift) from the Geometry sub menu and, using the Menu Left/Right keys, center the picture on the screen.
8. Use the Menu Up/Down keys to select EWW from the Geometry sub menu, and use the Menu Right key to increase the value to obtain a slight overscan.

Note: Remember, adjusting EWW will affect other horizontal adjustments.

9. If other Geometry adjustments are needed, proceed to the necessary adjustment using the Menu Up/Down keys.
10. Upon completion of Geometry adjustments, press the Menu button to return to the top level SAM menu.

East-West Parabola/Width (EWP):

1. Enter the Service Alignment Mode (SAM) by pressing the following key sequence on the remote control transmitter:
   0-6-2-5-9-6-Status
   Do not allow the display to time out between entries while keying the sequence.
2. From the top level SAM menu, use the Menu Up/Down keys to highlight the Geometry sub menu.
3. Use the Menu Left/Right keys to enter the Geometry sub menu.
4. In the Geometry sub menu, use the Menu Up/Down keys to select EWP.
5. Input a crosshatch pattern to the antenna/cable input terminal.
6. Use the Menu Left/Right keys to adjust the value of EWP.
7. This adjusts the top and bottom of the right and left side of the raster, adjusting the raster by “bending” it out or in.
8. This adjustment should be set so that the screen appears to be straight and “flat.”
9. If other Geometry adjustments are needed, proceed to the necessary adjustment using the Menu Up/Down keys.
10. Upon completion of Geometry adjustments, press the Menu button to return to the top level SAM menu.

East-West Trapezium (EWT):

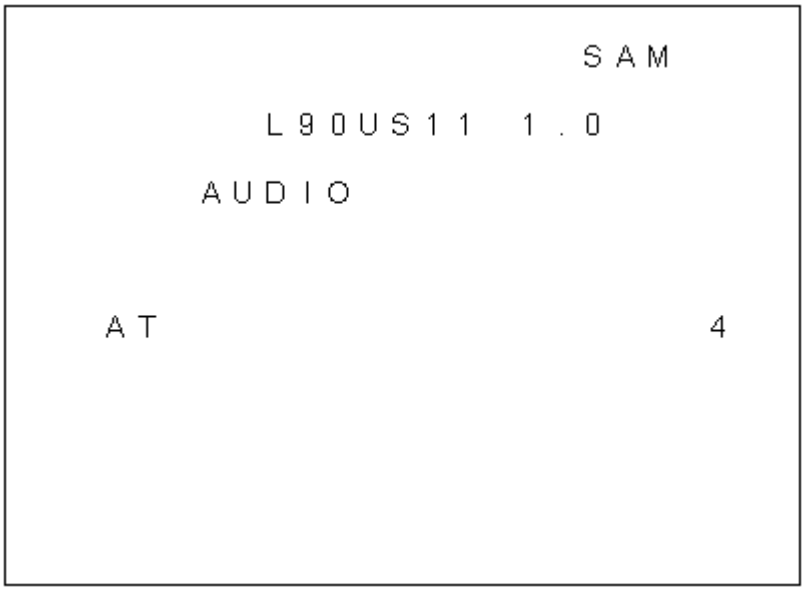
1. Enter the Service Alignment Mode (SAM) by pressing the following key sequence on the remote control transmitter:
   0-6-2-5-9-6-Status
   Do not allow the display to time out between entries while keying the sequence.
2. From the top level SAM menu, use the Menu Up/Down keys to highlight the Geometry sub menu.
3. Use the Menu Left/Right keys to enter the Geometry sub menu.
4. In the Geometry sub menu, use the Menu Up/Down keys to select EWT.
5. Input a crosshatch pattern to the antenna/cable input terminal.
6. Use the Menu Left/Right keys to adjust the value of EWT.
7. This balances the width at the top of the screen to the width at the bottom of the screen.
8. This adjustment should be set so the top and bottom of the screen are of equal width.
9. If other Geometry adjustments are needed, proceed to the necessary adjustment using the Menu Up/Down keys.
10. Upon completion of Geometry adjustments, press the Menu button to return to the top level SAM menu.

East-West Corner Parabola (EWC):

1. Enter the Service Alignment Mode (SAM) by pressing the following key sequence on the remote control transmitter:
   0-6-2-5-9-6-Status
   Do not allow the display to time out between entries while keying the sequence.
2. From the top level SAM menu, use the Menu Up/Down keys to highlight the Geometry sub menu.
3. Use the Menu Left/Right keys to enter the Geometry sub menu.
4. In the Geometry sub menu, use the Menu Up/Down keys to select EWC.
5. Input a crosshatch pattern to the antenna/cable input terminal.
6. Use the Menu Left/Right keys to adjust the value of EW CORNER.
7. This adjustment affects the very corner sections of the raster, and acts as a “touch-up” of the EWP (East-West Parabola/Width) adjustment.
8. This adjustment should be set so the corners of the screen are straight and equal in size.
9. If other Geometry adjustments are needed, proceed to the necessary adjustment using the Menu Up/Down keys.
10. Upon completion of Geometry adjustments, press the Menu button to return to the top level SAM menu.

Audio sub menu

The audio sub menu item values are stored in EEPROM if this sub menu is left.
A sample display of the Audio sub menu is shown below.



The Audio sub menu contains the following item on stereo chassis:

Sub Menu: **AUDIO**		**Values**	**Remarks**
AT	Attack time at AVL	1 – 4	Normal setting is 4.

Audio Adjustment:

Attack Time at AVL (AT):

1. Enter the Service Alignment Mode (SAM) by pressing the following key sequence on the remote control transmitter:
   0-6-2-5-9-6-Status
   Do not allow the display to time out between entries while keying the sequence.
2. From the top level SAM menu, use the Menu Up/Down keys to highlight the Audio sub menu.
3. Use the Menu Left/Right keys to enter the Audio sub menu.
4. Use the Menu Left/Right keys to adjust the value of AT.
5. Set the volume of AT to 4.
6. Upon completion of Audio adjustment, press the Menu button to return to the top level SAM menu.

Convergence and Purity Adjustments

Notes:

1. The following adjustments were performed with a Sencore VG91 Universal Video Generator.
2. Set the VG91 Generator as follows: STD TV Ch. 3, RF-IF Range set to HI, RF-IF Level set to NORMAL (1), Video Pattern = Raster, R-G-B raster controls OFF, Mode Switch set to L+R, Audio Frequency set to 300Hz, and 0 Pilot (max. CCW).
3. Connect the RF output of the generator to the Television Antenna Input, and adjust the VG91 level to remove any snow from the raster.

Pre-Convergence Procedure

Note: The degaussing procedure should be performed prior to this adjustment.

1. Place the multi-pole Purity and Convergence Assembly with the 2-Y pole purity rings directly in the gap between the G2 and G3 (focus) grids as shown in the "**Convergence and Purity Assembly**" graphic.
2. Enter Service Alignment Mode (refer to Service Alignment Mode section).
3. Apply a center cross or crosshatch pattern to the antenna/cable input terminal.
4. Select the White Tone sub-menu by pressing the Menu Up/Down keys on the remote control so that White Tone is highlighted.
5. Use the Menu Left/Right keys to enter the White Tone sub-menu.
6. Use Menu Up/Down keys to toggle between the options. Be sure to record the values of all options (Normal Red/Green/Blue, Delta Cool Red/Green/Blue, and Delta Warm Red/Green/Blue).
7. Use the Menu Up/Down keys to select Normal Green, and use the Menu Left key to set Normal Green to minimum.
8. Loosen the yoke clamp screw, pull the yoke back, and remove the three yoke wedges.
9. Slide the yoke all the way forward so that it rests against the bell of the CRT.
10 Tighten the yoke clamp screw so that the yoke does not drop away from the bell of the CRT.
11. Slowly spread, and if necessary, rotate the 2-Y pole purity rings so that the red and blue lines are at least parallel and preferably coincide at the 6:00 and 12:00 positions as shown in the "**2Y Spread and 2Y Rotate**" graphic.
12. Proceed to the Color Purity Adjustment.

Color Purity Adjustment

1. Connect a solid white pattern signal to the antenna/cable input terminal.
2. Use the Menu Up/Down keys to select Normal Blue, and use the Menu Left key to set Normal Blue to minimum.
3. Use the Menu Up/Down keys to select Normal Red, and use the Menu Right key to set Normal Red to maximum.
4. Slowly spread the 2-X pole purity rings to center the red portion of the screen, leaving the same amount of green on one side of the screen as blue on the other side.
5. Tighten the yoke clamp screw slightly so that the yoke may be moved with some friction.
6. Proceed to the Static Center Convergence Adjustment.

Static Center Convergence Adjustment

1. Apply a center cross or crosshatch pattern to the antenna/cable input terminal and observe the screen to ensure that the yoke is not tilted. If necessary, rotate the yoke to obtain a level raster.
2. Use the Menu Up/Down keys to select Normal Blue, and use the Menu Right key to set Normal Blue to maximum.
3. Slowly spread, and if necessary, rotate the 4-pole magnetic rings to converge red and blue lines at the center of the screen.
4. Use the Menu Up/Down keys to select Normal Green, and use the Menu Right key to set Normal Green to maximum.
5. Slowly spread, and if necessary, rotate the 6-pole magnetic rings to converge red/blue on green lines at the center of the screen.
6. Repeat steps three and five for optimum performance.
7. Proceed to the Dynamic Edge Convergence Adjustment.

(Display Convergence and Purity Assembly)

Dynamic Edge Convergence Adjustment

Note: To secure the correct position of the deflection yoke, three rubber wedges are used. They are ultimately to be placed as shown in Figure 3c or Figure 4c.

1. Apply a crosshatch pattern to the antenna/cable input terminal.
2. Use the Menu Up/Down keys to select Normal Green, and use the Menu Left key to set Normal Green to minimum.
3. Tilt the yoke up and down to converge the red and blue vertical lines at the 6:00 and 12:00 positions and the red and blue horizontal lines at the 3:00 and 9:00 positions (refer to Figure 5). When the correct position has been found, place a rubber wedge between the yoke and the CRT. If the yoke is tilted up, place wedge one as shown in Figure 3a; if it is tilted down, place wedge one as shown in Figure 4a.
4. Tilt the yoke to the left and right to find the point of best possible convergence of the red and blue lines at the edges, top and bottom of the screen as shown in Figure 6. When the correct position is located, place wedges two and three as shown in Figure 3b or Figure 4b.
5. Remove wedge one and place it in the final position as shown in Figure 3c or Figure 4c.
6. Use the Menu Up/Down keys to select Normal Green, and use the Menu Right key to set Normal Green to maximum.
7. Proceed to the White Balance Setup.

(Display Figures 3a, 3b, 3c, 4a, 4b, & 4c of Wedge Placement Display)

(Display Figures 5 & 6 of Yoke Tilt Display)

Master Screen (VG2)/ White Balance Setup:

1. With the set OFF, rotate VG2 (located on the lower part of the flyback transformer) counterclockwise.
2. Use the Power Button (on the remote control or the local keyboard) to turn the set ON, without a signal, and rotate VG2 clockwise until snow is visible.
3. Enter Service Alignment Mode (refer to Service Alignment Mode section).
4. Enter the Virtual Customer Menu by pressing the Menu button on the remote and set brightness and picture to 31 and color to 0.
5. Apply an NTSC color bar signal to the antenna/cable input terminal and tune to the active channel.
6. Connect an oscilloscope, 20V per division and 10 uSec time base, to pin 6 of the CRT Socket. Observe the stairstep pattern while adjusting VG2.

Hint: Counterclockwise adjustment will compress bottom of stairstep pattern. Clockwise adjustment will compress top of stairstep pattern.

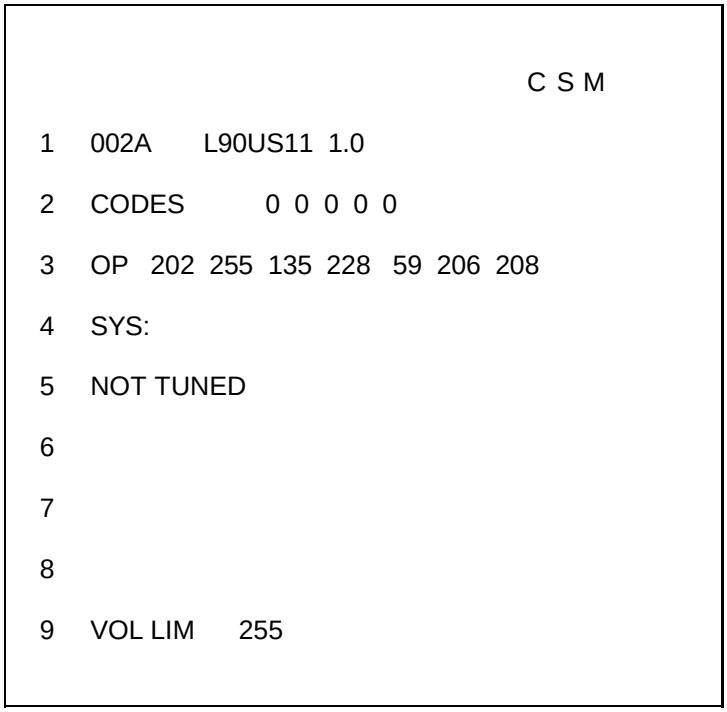
7. Adjust VG2 midway between top and bottom compression.
8. Proceed to White-Tone Adjustments under White Tone sub-menu in the Service Alignment Mode section to complete White Balance Setup.

Customer Service Mode (CSM)

1. The Customer Service Mode (CSM) is used to retrieve data on the TV operation settings and stored error codes.
2. To enter the Customer Service Mode, press and hold the Mute button on the

remote control and any key on the local keyboard (except ”Power“) for more than 4 seconds. When the set is in Customer Service Mode, the text "CSM" is displayed in the top right corner of the screen.

3. To use this system, the customer is instructed by phone to enter CSM and read off the display that appears. This information is useful to gain insights into failures before traveling to the customer's home.
4. This information can also be used to avoid nuisance trips to the home when the problem is an operational error (example: Closed Caption is on or set is in Hospital Mode).
5. When entering CSM, all disruptive functions are turned off, and service unfriendly modes are ignored. While CSM is active, no changes can be made in settings or functions. When CSM is exited, the TV returns to all prior operational settings.
6. To exit CSM, press any key (on the remote control or local keyboard) except ”Channel Up“ or ”Channel Down.“
   To exit CSM and return the set to normal operation mode, press any key on the local keyboard or the remote control except Channel Up, Channel Down, or Power.
   To exit CSM and turn the set off, press the Power button on either the TV set or the remote control.
7. A sample CSM display is shown below.



Explanation of CSM Display Screen

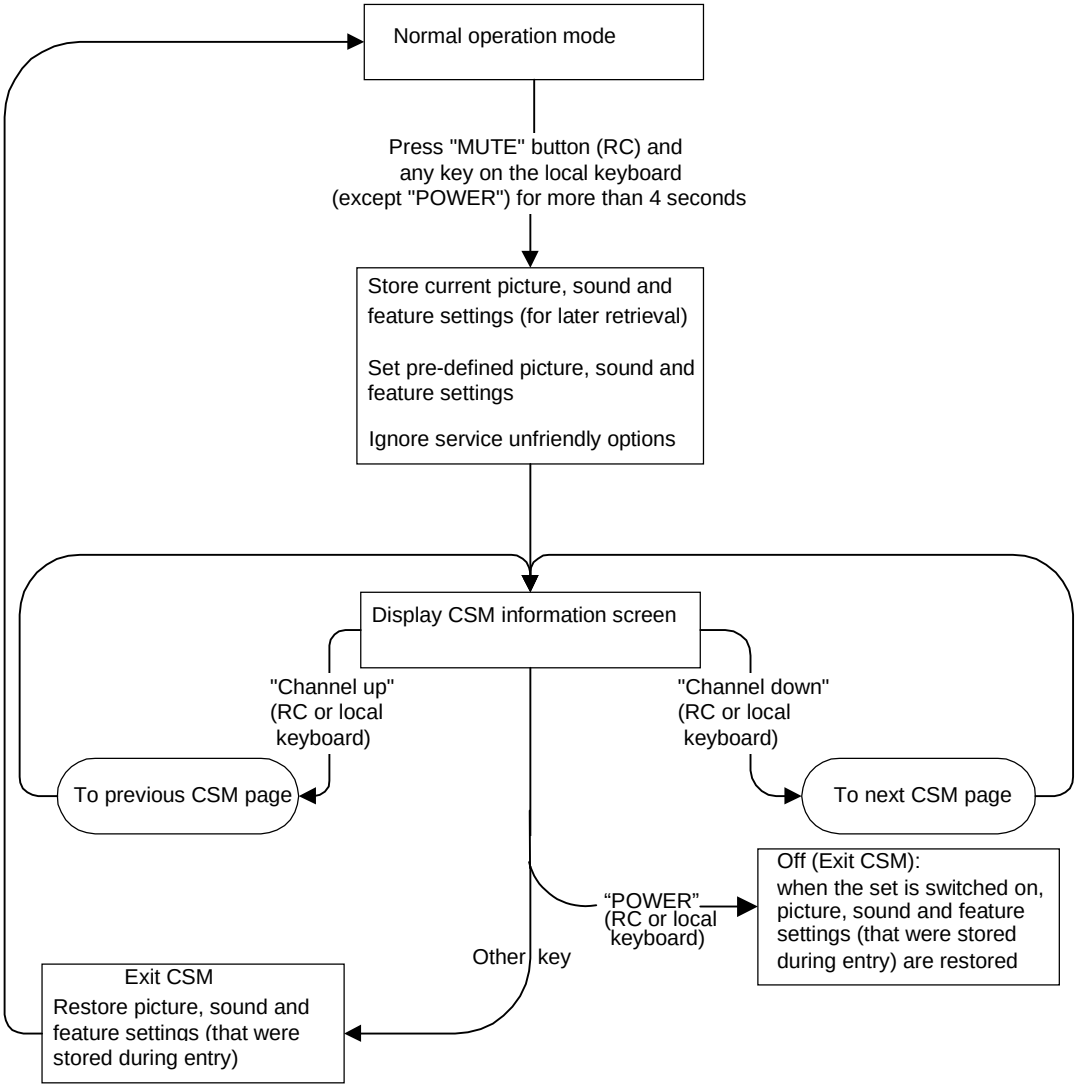
The following information is displayed on screen:

- Text ”CSM“ on the first line
- Line number for every line (to make CSM language independent)
- To view multiple CSM pages (such as lines 8 and 9), use the Channel Up or Channel Down keys
- For more information on lines 1, 2, and 3, see SDM section ”Explanation of Display“
- Line 1 displays the run timer and the software identification, cluster, and version
- Line 2 displays the error buffer contents (the word ”error“ is not used on this

screen, instead ”codes“ is used)

- Line 3 displays the option code information
- Line 4 displays SYS: (This is not used)
- Lines 5 through 8 display information on active service unfriendly modes
- Line 5 displays the text ”NOT TUNED“ if no television station is tuned
- Line 6 displays the text ”TIMER“ if the sleep timer or ”on“ timer is active
- Line 7 displays the text ”LOCKED“ if one or more channels or presets is locked via child lock
- Line 8 displays the text ”HOSPITAL“ if hospital mode is active, or ”HOTEL“ if hotel mode is active
- If the volume limiter is active, line 9 displays the text ”VOL LIM“ and the set value of the volume limiter. If the volume limiter is inactive, the displayed value will be 255 (the maximum volume allowed).

CSM Flow Chart

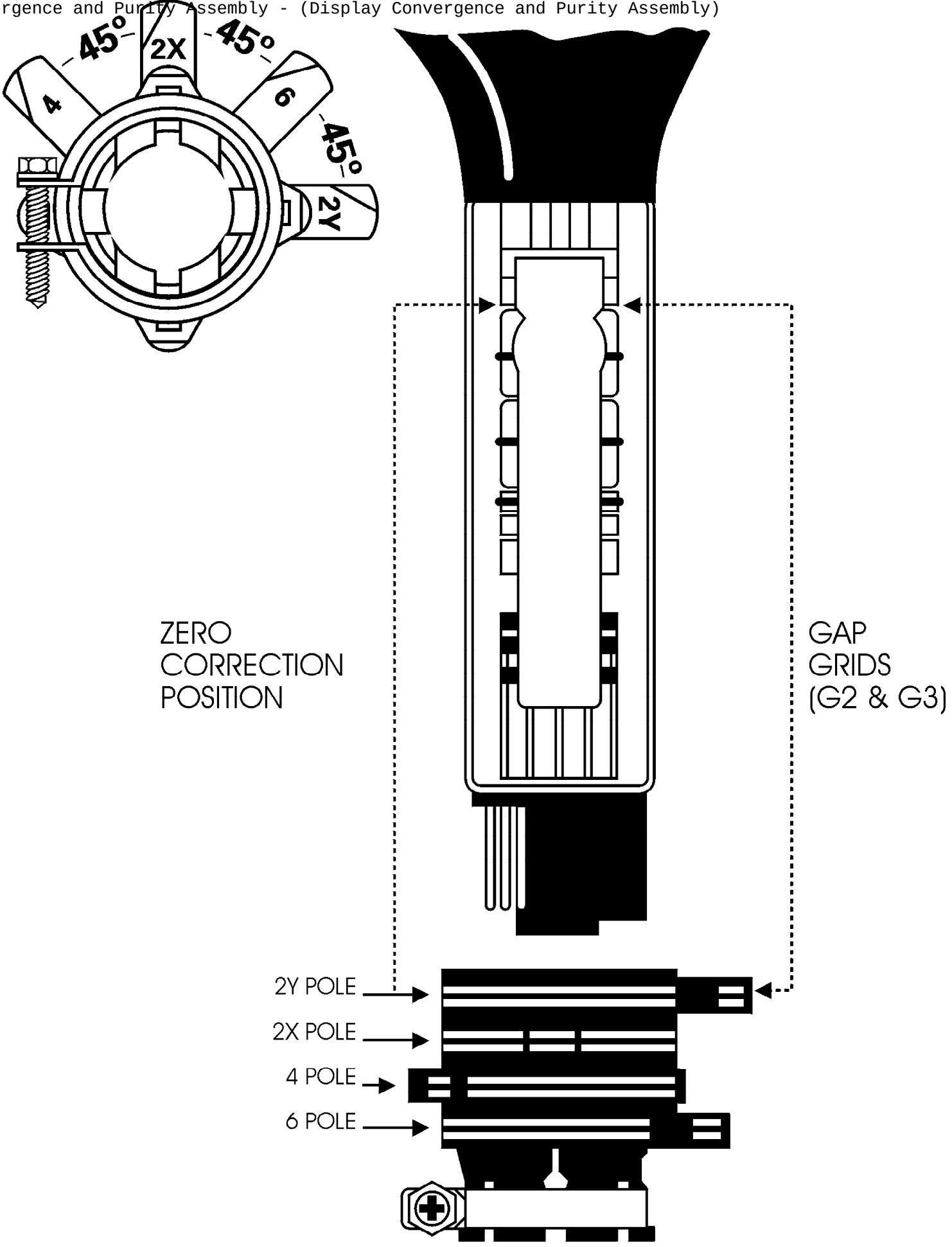


F8 CHASSIS OPTION BYTES & FEATURE LISTINGS

USA/CANADIAN CHASSIS LISTINGS

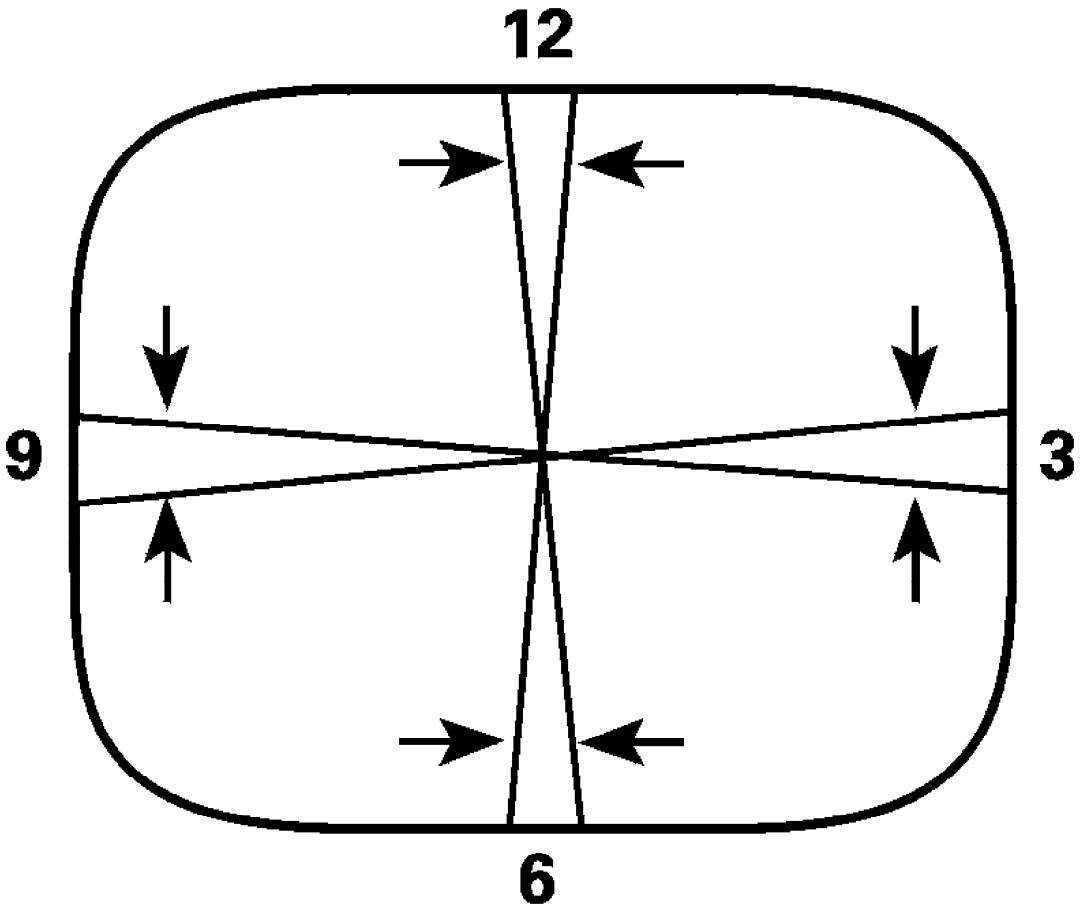
LATIN AMERICAN CHASSIS LISTINGS

INDUSTRIAL CHASSIS LISTINGS



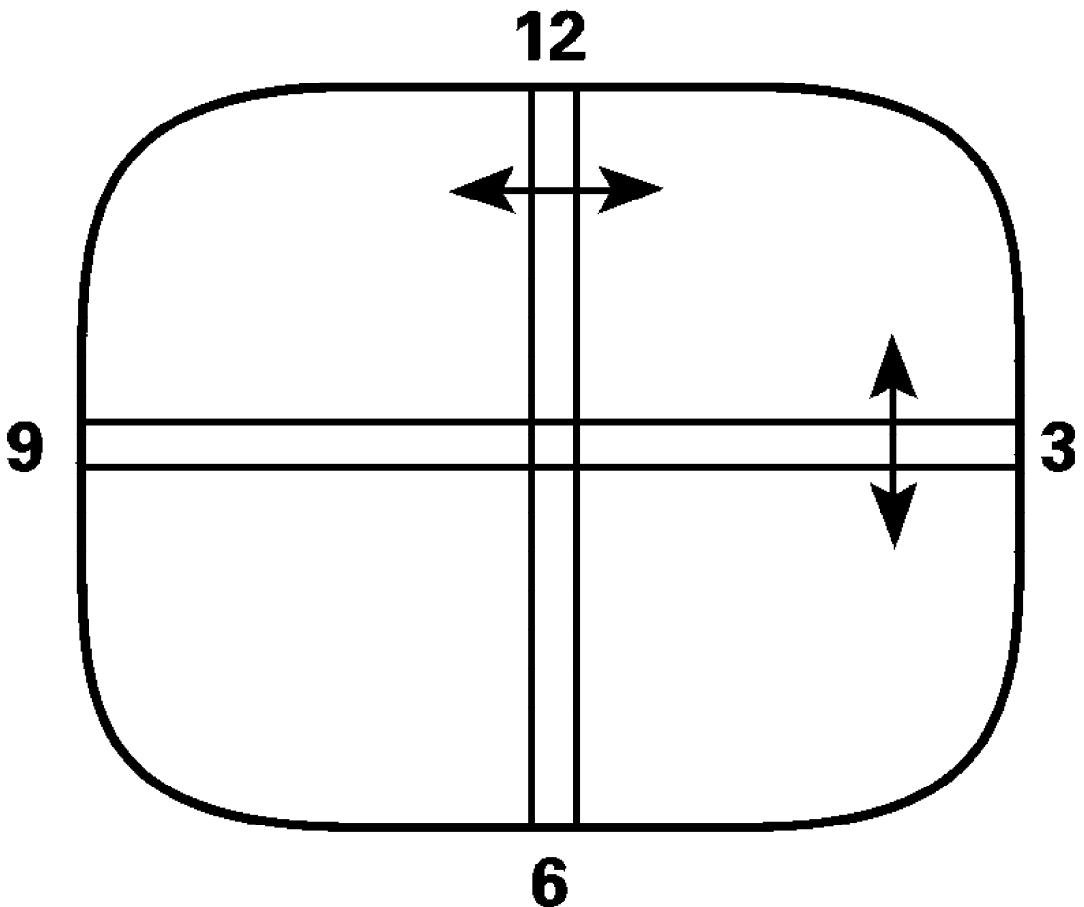
CONVERGENCE & PURITY ASSEMBLY

2Y SPREAD



2X
SPREAD

2Y ROTATE



2X
ROTATE

(Display Figures 3a, 3b, 3c, 4a, 4b, & 4c of Wedge Placement Display)

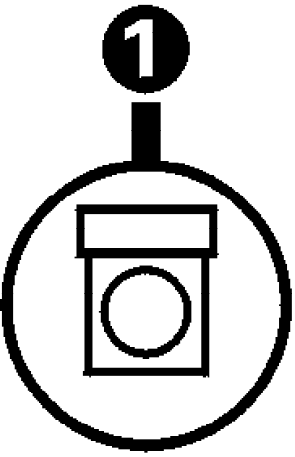


Fig. 3a

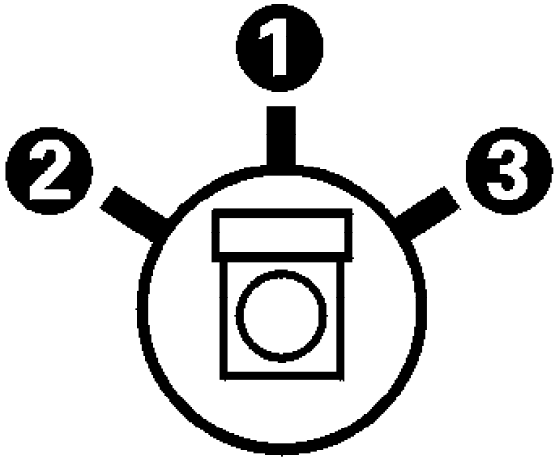


Fig. 3b

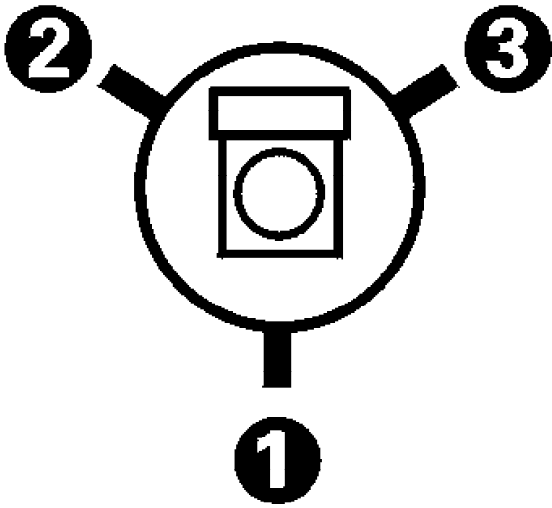


Fig. 3c

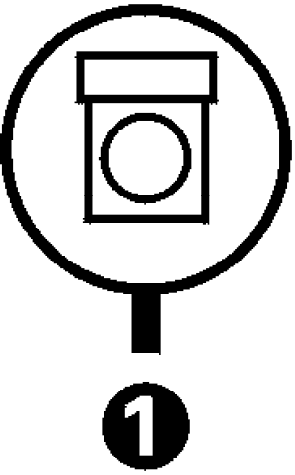


Fig. 4a

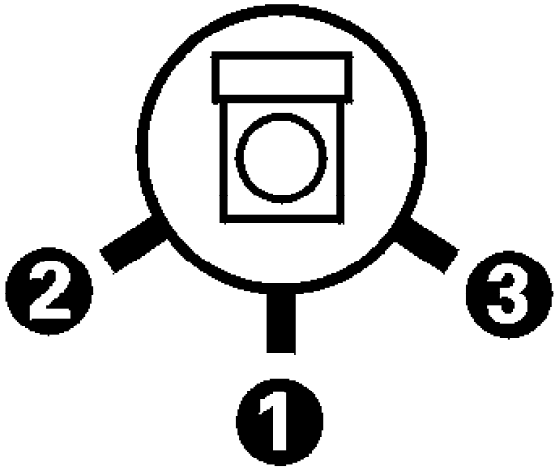


Fig. 4b

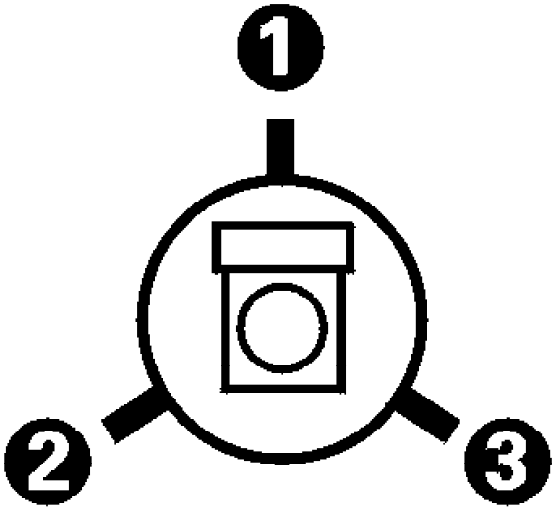


Fig. 4c

(Display Figures 5 & 6 of Yoke Tilt Display)

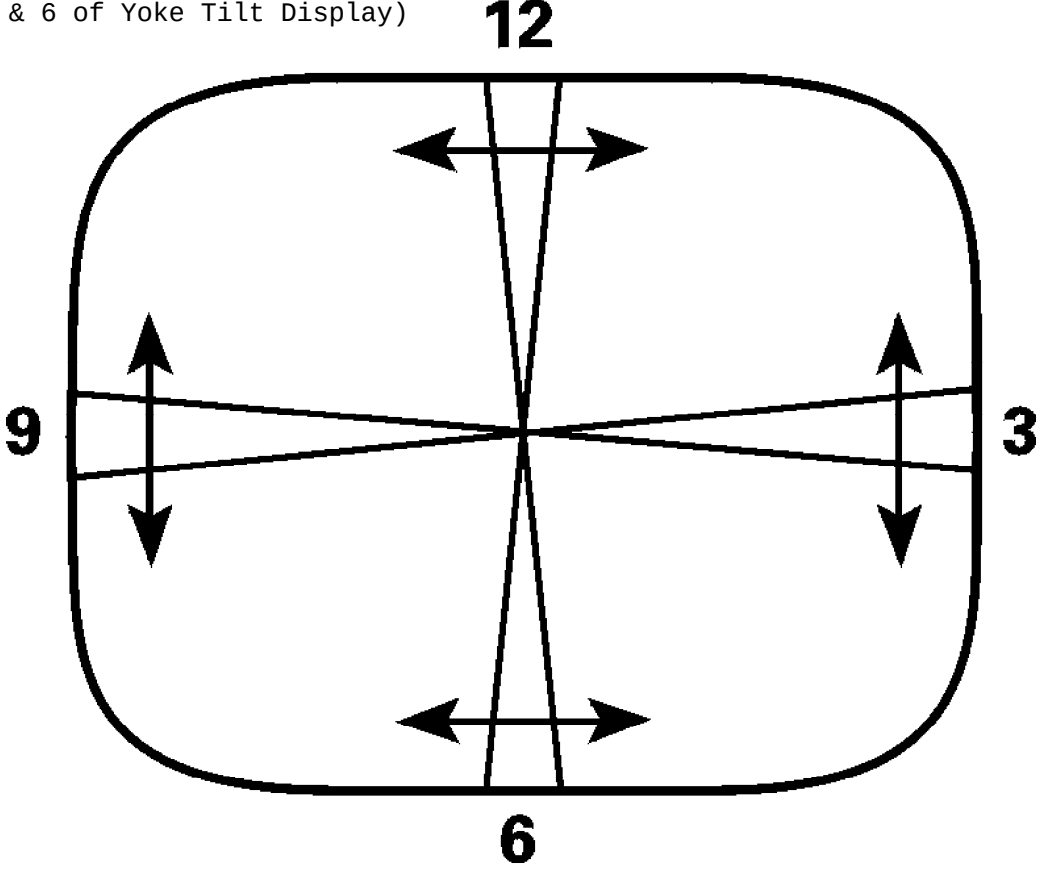


Figure 5

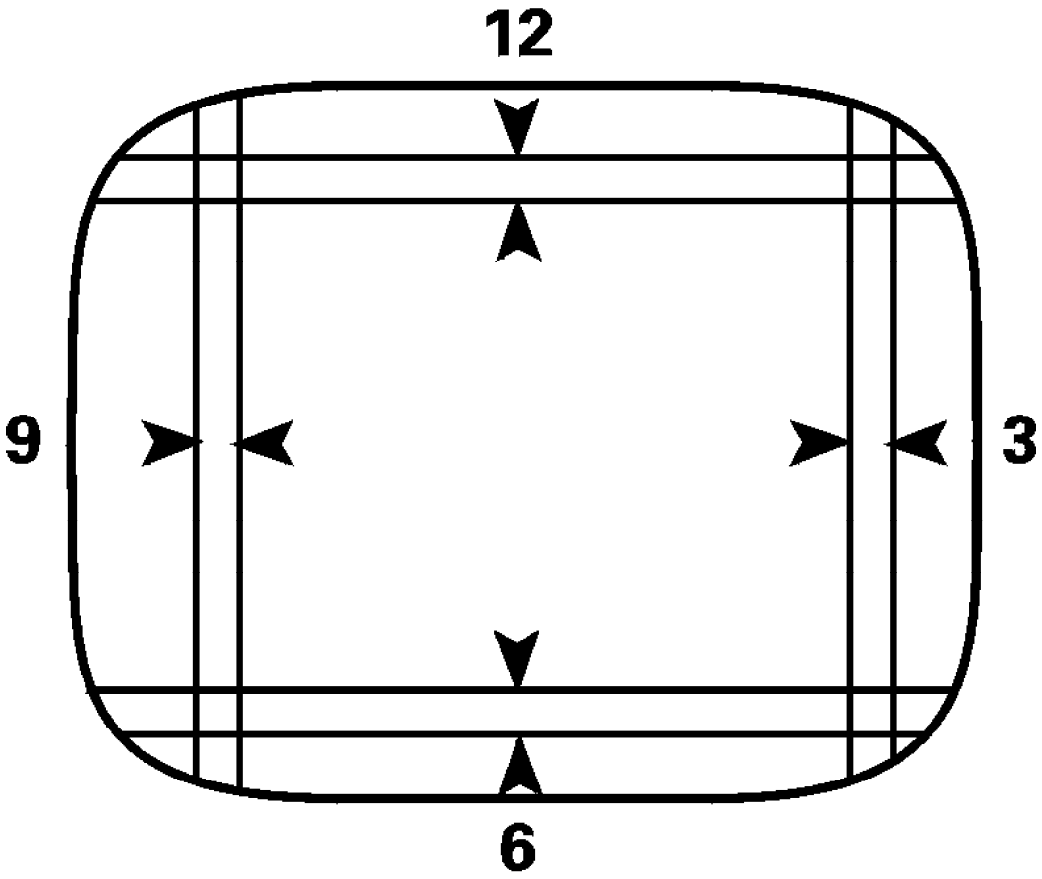


Figure 6

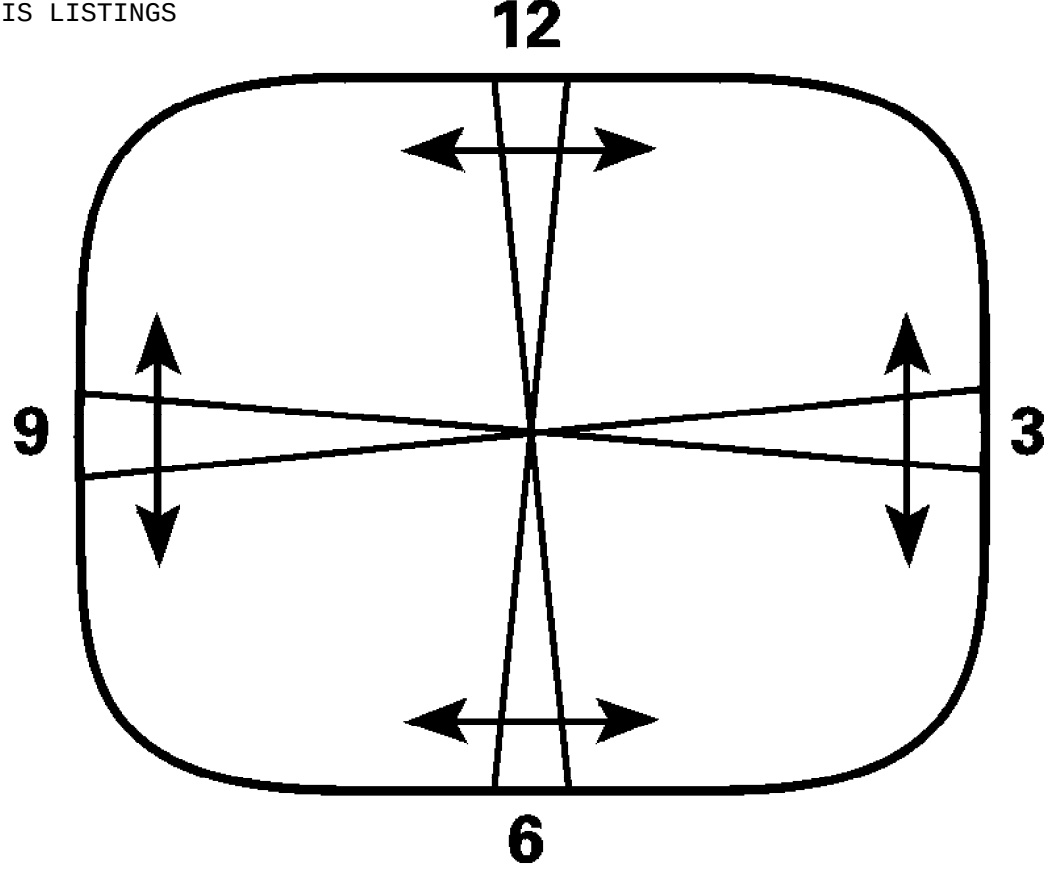


Figure 5

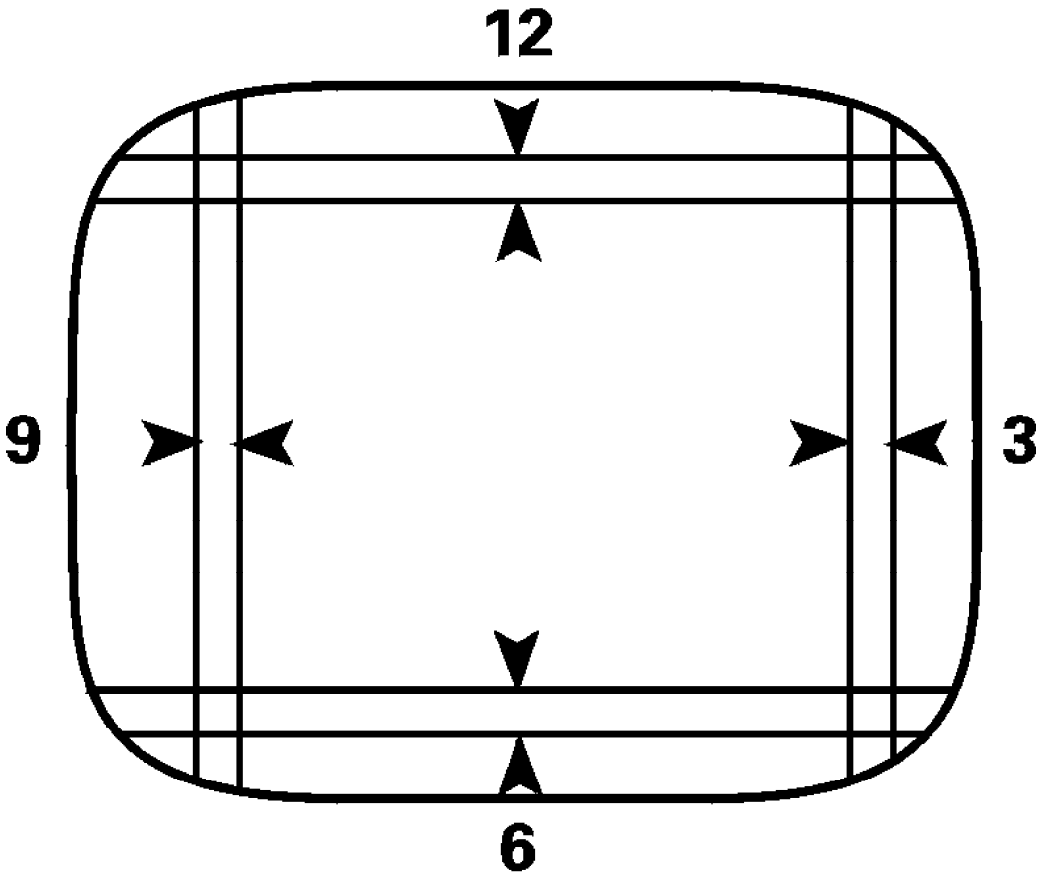


Figure 6

Philips Consumer Electronics

Technical Service Data

Service and Quality
Service Publications Dept.
One Philips Drive
P.O. Box 14810
Knoxville, TN 37914

Manual 7583
Model no.: 26LL590121
First Publish: 10-9-2000
Rev. Date: 08-02-2004
Print Date: 10/07/2006

Training Information

REFER TO SAFETY GUIDELINES

SAFETY NOTICE: ANY PERSON ATTEMPTING TO SERVICE THIS CHASSIS MUST FAMILIARIZE HIMSELF WITH THE CHASSIS AND BE AWARE OF THE NECESSARY SAFETY PRECAUTIONS TO BE USED WHEN SERVICING ELECTRONIC EQUIPMENT CONTAINING HIGH VOLTAGES.

CAUTION: USE A SEPARATE ISOLATION TRANSFORMER FOR THIS UNIT WHEN SERVICING

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F8 CHASSIS INTRODUCTION

The F8 chassis is a leader TV chassis produced by Philips Consumer Electronics Company for the 1999 model year. The F8 chassis is used in sets with 25“ and 27“ screen sizes. The F8 chassis is a global design and is oriented front to rear, or ”north to south“, as it has been called. The F8 chassis tuning system features 181 channels with on-screen display (OSD). The main tuning system uses a tuner, a microcomputer IC, and a memory IC mounted on the main chassis. The microcomputer communicates with the memory IC, the customer keyboard, remote receiver, U/V tuner, signal processor IC and the audio output IC via the I^2C bus. The memory IC retains the settings for favorite stations, customer-preferred settings, and service/factory data.

The F8 chassis uses a Very Large Scale (VLSI) Integrated Circuit for signal processing. This IC performs video IF, sound IF processing, AGC control, horizontal and vertical drive and synchronization, also luminance/chrominance processing. The on-screen graphics and closed caption decoding are done within the microprocessor, and then sent to the signal processor IC to be added to the main signal.

The F8 chassis utilizes a switch mode power supply for the main voltage source. The chassis has a hot chassis ground reference on the primary side of the power supply, and a cold ground reference on the secondary side of the power supply and the rest of the chassis. **ALWAYS USE AN ISOLATION TRANSFORMER WHEN SERVICING THIS CHASSIS FOR YOUR SAFETY.**

SIGNAL FLOW DESCRIPTION

(Display Signal Flow Block Diagram)

The incoming RF signal is applied to the U/V tuner where the 45.75 MHz IF signal is developed and amplified. The IF signal then exits the tuner from pin11to pass through the SAW filter, (1003). The shaped signal is then applied to IC 7250, the IF processor. The automatic gain control (AGC) is performed in IC 7250 and applied to the U/V tuner at pin1. An automatic fine tuning signal (AFT) is also generated in the IC and then routed to the tuning system via the I^2C bus, to provide frequency correction as needed.

The IF signal exits IC 7250 at pin 6, the audio and video signals are separated and each processed accordingly. The sound IF signal enters IC 7250 at pin 1, while the video re-enters at pin 13. The audio signal passes through the pre-amp, volume control and volume limiting circuits before application to the final audio stages.

The video signal entering at pin 13, is separated into its luminance and chrominance components, and exits at pins 21, 20, and 19 as R, G, and B respectively. The R G B signals are sent to the CRT DRIVE board, amplified and applied to the CRT pins as drive. Drive and cutoff controls for the CRT are also located on this board.

Brightness, Picture, Sharpness, Color and Tint control voltages are varied by the microprocessor, IC 7600 through individual control lines. IC 7600 also controls selected inputs, as selected by the consumer.
Video and audio muting are an internal function of IC 7250. Automatic volume limiting also takes place inside this IC.

Vertical and Horizontal drive signals are also developed inside IC 7250. Vertical drive exits the IC from pin 47, while Horizontal drive exits at pin 40. These signals are a product of a Voltage Controlled Oscillator Circuit (VCO) and divider network located inside the chip. Vertical drive is applied to pin 1 of IC 7401, amplified, shaped, and output from pin 5 where it is applied to the vertical winding of the yoke. A feedback signal is returned to pin 46 of IC 7250. The vertical sync pulse is also applied to the

microprocessor, IC 7600, to pin 37 for On-Screen Display and Closed-Captioning synchronization. The horizontal drive signal exits IC 7250 from pin 40 and is applied to Q 7461, the horizontal driver transistor. The signal is amplified and coupled to the base circuit of Q 7460, the horizontal output transistor. The H.O.T. drives the Integrated Flyback Transformer, which provides high voltage, screen voltage, focus, G-2, and filament voltages for the CRT. A scan-derived power supply is also provided by the IFT. It supplies -13 volts, +13 volts, +50 volts, a secondary +5 volt supply, and a +200 volt source for video drive. The secondary of the IFT is monitored by safety circuits and is tied back to the microprocessor and signal-processing IC's to turn the set off if a problem should occur.

POWER SUPPLY DESCRIPTION

(Display Power Supply Block Diagram)

The F8 chassis family uses a free-running switch-mode power supply with a single controller IC. As AC power is applied to the set, approximately 160volts DC is developed by the bridge rectifiers and fed to the primary winding of the power transformer, then to the FET switch. The start voltage for the power supply is taken from the hot leg of the AC input. This voltage goes to controller IC 7520. A separate operating voltage is developed from the power transformer, rectified, and applied to IC 7520. The power supply is on all the time; there is no standby mode. The set is turned on and off by the microprocessor switching the +8 volt regulator on and off. The +8 volt is the supply voltage for the signal processor. IC7520 is regulated by means of a feedback circuit, monitoring the +11 volt secondary line. Any voltage variations are reflected back to the controller IC 7520 through an Opto-Coupler IC and change the operating frequency of the power supply as needed. **REMEMBER TO USE AN ISOLATION TRANSFORMER WHEN SERVICING THIS CHASSIS.**

Complete Circuit Description

When AC is applied, current flow through the Bridge Rectifier circuit causes two simultaneous events to occur:

1. Capacitor 2508 begins to charge to 160 volts DC.
2. Capacitor 2540 begins to charge to 14.5 volts DC.

When capacitor 2508 is fully charged, 160 volts is applied to the drain of 7518, through transformer 5545. When capacitor 2540 is fully charged, 14.5 volts is applied to pin 1 of 7520. This voltage will cause 7520 to begin oscillating and putting out a pulse train on pin 3. These pulses will cause 7518 to conduct which will cause a field to build up in the primary winding of transformer 5545. When this field collapses, a field will be induced in the secondary windings. Pins 8 and 9 of 5545 will output to diode 6540, which will rectify the pulses. Capacitor 2540 will filter the pulses and provide approximately 12.5 volts to pin 1 of 7520. This now becomes the RUN voltage for 7520.

Feedback control is accomplished by monitoring the 140 volt line. The 140 volt, +VBATT supply is sent through resistor 3571 to pin 3 of the Programmable Regulator

IC, 7570. This regulator will turn on at 2.5 volts DC. Current will then begin to flow through the diode portion of the Opto-Isolator IC, 7581. The intensity of light caused by this current flow will then control the conduction of the transistor portion of 7581. The voltage appearing on pin 4 of 7581 is then monitored by pin 14 of 7520 where it is compared to a 2.5 volt reference voltage. Changes felt on pin 14 will control the width of the pulses coming out of pin 3. These pulse changes will determine the “on” time of 7518.

Video Signal Paths

Tuner Video

RF signals are received at the RF input connector on the tuner. From there they are amplified and sent to the IF circuits within the tuner. The IF signal is amplified and output on pin 11 and sent to the SAW filter, 1003, for shaping prior to being input to pins 48 and 49 of the Signal Processor IC,
7250.

AGC voltage is generated in 7250 along with AFT information. The AGC is output on pin 54 and enters the tuner on pin 1. The AFT information is sent to the micro via the IIC bus. AFT and Tuning information are then sent from the micro to the tuner where they enter at pins 4 and 5.

After processing, Composite Video exits 7250 at pin 6 and is buffered by transistor 7266. It is then sent through filter 1201 to remove any audio component. From there, it re-enters 7250 on pin 13.

Once inside 7250, the signal is split in two directions. It is demodulated, processed and output as Luminance, R-Y and B-Y on pins 28, 29 and 30.
From there it re-enters 7250 on pins 27, 31 and 32. It is also directly passed through from pin 13 to pin 38 where it is output and split, once again, in two directions. WE WILL RETURN TO THIS PATH LATER.

After entering at pins 27, 31 and 32 they are mixed with the signals for OSD or Closed Captioning coming from the micro, into pins 23, 24, 25 and 26.
After being processed by the matrix circuit they are output to the CRT Panel
on pins 18, 19, 20 and 21.

The signals then enter IC7330 for amplification, output on pins 7, 8 and 9 to the CRT socket and then to the CRT.

Now, back to where our Video exited 7250 at pin 38 and split in two directions. The first path is from pin 38 through buffer transistor 7134 to 0223, the Video Output Jack. The second path is from pin 38 through buffer transistor 7258 to pin 23 of the microprocessor. This video is used for OSD and Graphics.

External Video

External Video enters at 0223F, the Video Input Jack. From there it is routed to pin 17 of 7250. At this point it is treated the same as Tuner Video.

SVHS

SVHS enters the Jack Panel at S_VHS connector, 1071-A and the Y and C signals are sent to IC7250, pins 10 and 11. Once the Y and C components enter 7250 they are processed the same as any other video/chroma.

Audio Signal Paths

The composite signal coming out of pin 6 of IC7250 is buffered by 7266 and sent through Jumper 4214. Then it goes through a video stripping network consisting of capacitor 2850, resistor 3850, inductor 5833, and capacitor 2887. Here, the video component is stripped and only the audio IF is allowed to be applied to pin 58 of the Audio Decoder IC, 7833. After processing, the left and right audio signals are output on pins 28 and 29 and sent to the Audio Output IC, 7950.

IC7950 amplifies the left and right audio, outputs them on pins 8 & 10 and 11 & 13 and sends them to the Headphone/Speaker circuit. This circuit determines which output medium will be used. If there is not a set of headphones plugged into the Headphone Jack (0232), the left and right audio are sent to the speaker connector, 0234. If there is a set of headphones connected, the audio will be sent through the headphones only.

In Mono versions, the Audio IF is taken from pin 6 of 7250, buffered by 7266 and sent to transistor 7000 for amplification. It then passes through the bandpass filter, 1001, and enters IC7250 on pin 1. The signal is processed and exits on pin 15. From there it is sent to pin 55 of IC 7833, processed and output on pin 29. From there it goes to pin 3 of IC7950 where it is amplified and output on pins 11 and 13. This Mono signal is then applied to the Headphone/Speaker circuit on the L+ and L- lines. If there is no headphone
connected, the output will be to connector 0215.

External audio is applied to the Jack Panel and sent to pins 49 and 50 of IC7833 where it is processed and output on pins 28 and 29 and from there on, treated the same as any other audio.

Volume control and muting is accomplished from pin 2 of the microprocessor to pin 7 of the audio output IC.

Sweep Circuits

Horizontal Circuit

The horizontal drive pulse is internally generated in IC7250 and is output on pin 40. This pulse is amplified by transistor 7461 and transformer coupled by 5461 to the base of the Horizontal Output, 7460, where it is amplified.

Shaping takes place in the collector circuit (C2463 and C2465), which results in a perfectly timed 825 volt peak-to-peak pulse to drive the deflection yoke and the flyback transformer.

The Flyback Transformer secondary windings produce 10 working voltages:

VlotAux-11V, VlotAux+11V and VlotAux+50V all supply power to the vertical output IC, 7401.

The 187 volt VideoSupply, the filament voltage, Screen voltage (VG2) and Focus voltage all go to the CRT board.

The EHT voltage goes to the anode connection on the CRT.

The VT_Supply and the VlotAux+5V Supply both go to the Tuner. The VT_Supply is zenered down to 33 volts for tuning voltage and the VlotAux+5V supply acts as B+ for the Tuner and also becomes the +5 volt supply. The VlotAux+5V supply also provides voltage to the Audio Circuits.

Vertical Circuit

The vertical drive signals are internally generated in IC7250 and are output on pins 46 and 47. From there they are sent to the Vertical Output IC, 7401, pins 1 and 7.

Inside the IC, the waveforms are amplified, shaped and output on pins 5 and 6. The output on pin 5 is the waveform that drives the yoke and provides feedback to the IC. The output on pin 6 is the Vertical Synchronization pulse that is sent to pin 37 of the microprocessor.

Microprocessor

The Microprocessor IC, 7600, is powered by a 3.3 volt source (3V3). This voltage is derived from the Regulator transistor, 7603. Transistor 7603 is fed from the Vaux, 11 volt supply in the power supply.

The microprocessor communicates with the memory IC, 7601, the Signal Processor IC, 7250, the IR receiver, 7680, the Audio Decoder IC, 7833, the Audio Output IC, 7950, the U/V tuner and the customer keyboard.

Reset is accomplished shortly after AC is applied. Transistor 7604 is delayed in turning on by the network consisting of Zener Diode, 6607, and Resistors 3635 and 3636. This delay is enough to allow the 3.3 volt B+ to the microprocessor come up and through resistor 3634, place a high on pin 43 (Reset). After the delay, transistor 7604 is turned on causing pin 43 to go low.

Closed Captioning and On Screen Graphics are generated inside the microprocessor and sent to the Signal Processor to be added to the main signal. Synchronization for these processes is provided by feeding Horizontal and Vertical pulses into the micro on pins 36 and 37.

Protection circuits on the main board all tie into the base of Transistor 7605. When any one of the protection circuits output a high, it is felt on the base of 7605. When 7605 is turned on, pin 16 of 7600 is brought low which tells the micro to shut the set down.

Shutdown Circuits

Three of the shutdown protection circuits are derived from pins 7 and 10 of the Flyback Transformer.

If the voltage on the filament line (pin 7) goes too low, transistor 7482 will turn on and apply a positive voltage to the P9StbyOn+Protn line.

If the voltage on the filament line (pin 7) goes too high, transistor 7462 will turn on causing transistor 7463 to turn on and apply a positive voltage to the HEW_Protn line.

If the beam current (pin 10) becomes excessive, the voltage on the EHT line will go toward the negative direction. This action will cause transistor 7481 to turn on and place a positive voltage on the P9StbyOn+Protn line.

For sets having East West correction circuitry, pin 10 of 5545 is being monitored by transistor 7470. Transistors 7470, 7481 and 7482 all control transistor 7605. In the event of a problem, 7605 will bring pin 16 of the Microprocessor, 7600 low, shutting the set down.

How to Check an Opto-Isolator

Procedure

Using a basic diagram taken from the F8 schematic, we are going to determine whether or not IC7581 is functioning properly.

Step #1

Apply the positive lead of a variable DC power supply to the positive terminal of capacitor 2561. Connect the negative lead of the power supply to pin 1 of IC7570. *By connecting them this way we are able to use resistors 3685 and 3575 as protection for IC7570.*

Step #2

Apply the positive lead of an ohm meter to pin 5 and the negative lead to pin 4 of 7581. Set the ohmmeter to the 2K scale or greater.

Step #3

Slowly increase the DC voltage from 0 to 5 volts. If the IC is good, you will see the reading on the ohmmeter start decreasing as the voltage approaches 5 volts.
CAUTION: Do not exceed 5 volts DC.

How to Check a Programmable Regulator IC

Procedure

Using a basic diagram taken from the F8 schematic, we are going to determine whether or not IC7570 is functioning properly.

Step #1

Apply the positive lead of a variable DC power supply to pin 3 of IC7570 and the negative lead to cold (chassis) ground.

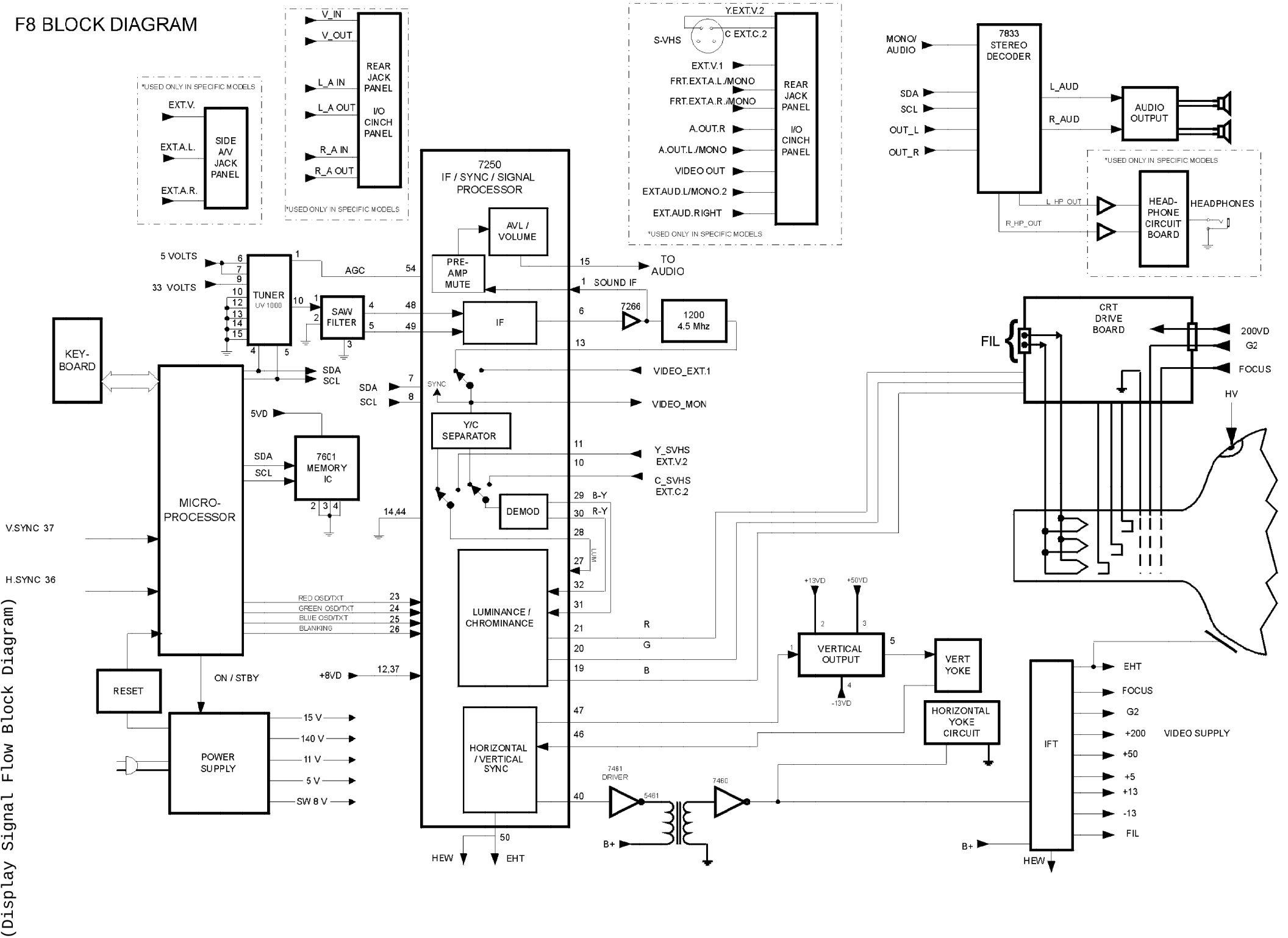
Step #2

Apply the positive lead of your DVM to pin 1 of IC7570 and the negative lead to cold ground.

Step #3

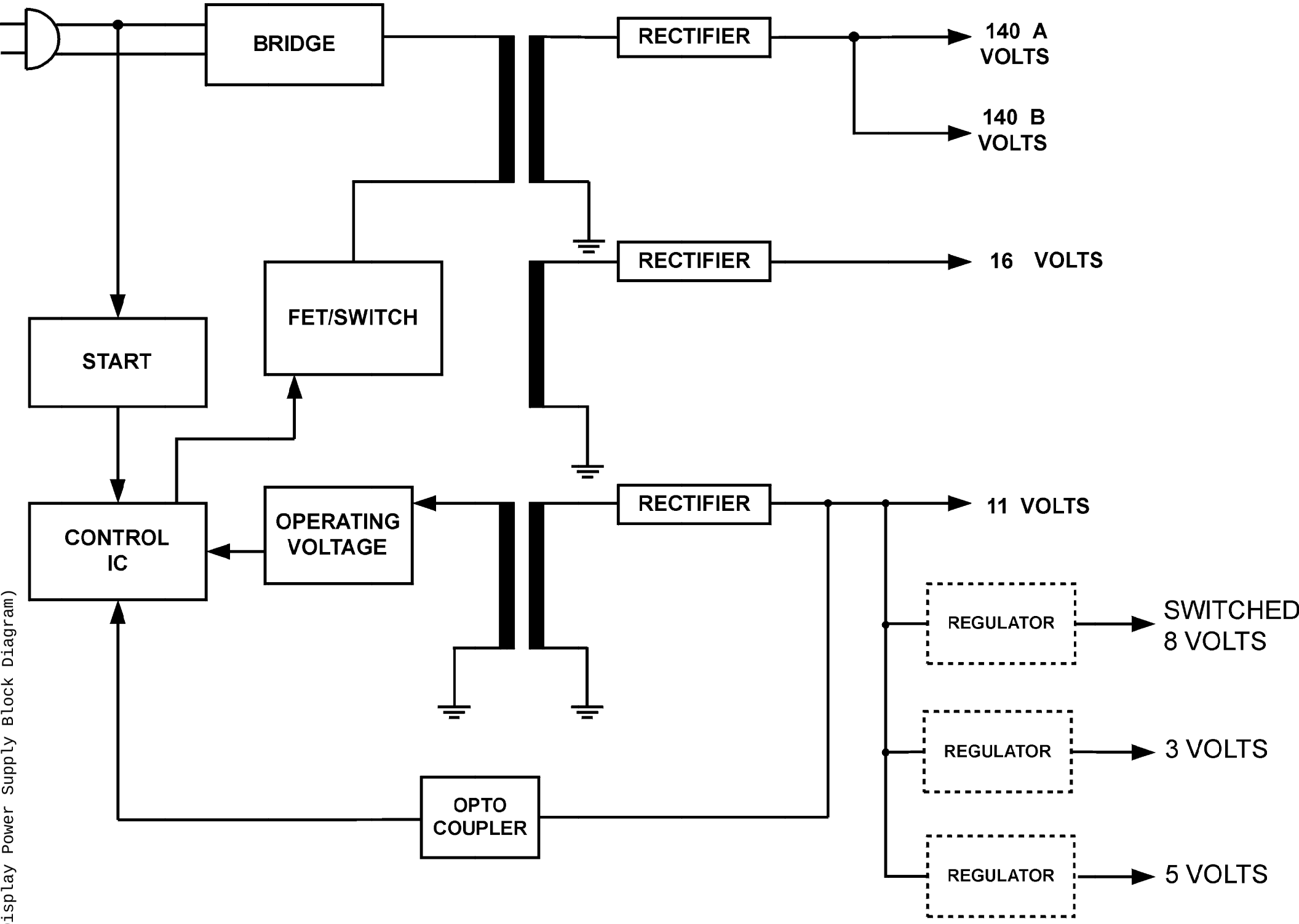
Slowly increase the DC voltage from 0 to 2.5 volts. If the IC is good, you will begin to see a DC voltage reading on your DVM as soon as the applied DC voltage is 2.5 volts.

F8 BLOCK DIAGRAM



(Display Signal Flow Block Diagram)

F8 POWER SUPPLY



(Display Power Supply Block Diagram)

Philips Consumer Electronics

Technical Service Data

Service and Quality
Service Publications Dept.
One Philips Drive
P.O. Box 14810
Knoxville, TN 37914

Manual 7583
Model no.: 26LL590121
First Publish: 10-9-2000
Rev. Date: 08-02-2004
Print Date: 10/07/2006

Parts List

REFER TO SAFETY GUIDELINES

SAFETY NOTICE: ANY PERSON ATTEMPTING TO SERVICE THIS CHASSIS MUST FAMILIARIZE HIMSELF WITH THE CHASSIS AND BE AWARE OF THE NECESSARY SAFETY PRECAUTIONS TO BE USED WHEN SERVICING ELECTRONIC EQUIPMENT CONTAINING HIGH VOLTAGES.

CAUTION: USE A SEPARATE ISOLATION TRANSFORMER FOR THIS UNIT WHEN SERVICING

Main Chassis Parts

	Main Chassis Parts		
S 0127	3.15 Amp Fuse,	3122 358 72141	
0138	Clip for 7401.	3135 011 01031	
0140	Clip for 7460.	3135 011 01031	
0152	Cable, DIP, 6 Pin, 400mm	3104 301 09421	
0153	4 Pin Cable.	3104 301 09431	
0212	Connector, 2 Pin	2422 025 15396	
0220	4 Pin Board Connector.	2422 025 04852	
0223	3 Pin Board Connector.	2422 026 04963	
0224	1 Pin Board Connector.	2422 034 20021	
0228	1 Pin Board Connector.	2422 034 20021	
0234	Connector, 4 Pin	2422 025 12479	
S 0243	Connector, 6 Pin	2422 025 04854	
0244	4 Pin Board Connector.	2422 025 04852	
S 0245	Connector, 6 Pin	2422 025 04854	
S 0254	CRT Socket (9 Pin)	2422 500 80022	
0267	Connector, 3 Pin	2412 020 00725	
1000	Tuner.	2422 542 90057	
1001	Filter	2422 549 42501	
1003	45 MHz SAW, Filter,	2422 549 42433	
1200	Filter, Ceramic, 4.5MHz.	2422 549 40807	
1208	Crystal Resonator.	4835 242 77276	
S 1500	Fuse, 4A, 250V, IEC.	2422 086 10869	
S 1572	1 Amp, Radial Fuse,	4835 253 97162	
S 1573	2.5 Amp Fuse, Radial,	2422 086 10422	
S 1580	Relay, 12V	2422 132 07317	
1600	Switch, Tactile.	2422 128 02742	
1601	Switch, Tactile.	2422 128 02742	
1602	Switch, Tactile.	2422 128 02742	
1603	Switch, Tactile.	2422 128 02742	
1606	Switch, Tactile.	2422 128 02742	
1660	Crystal, Resonator, 12MHz, 20 Pin.	2422 543 00488	
1822	Crystal Resonator, 18MHz432, 12 Pin, HC 49/U A	2422 543 00842	
2001	Cap, 47n, 10%, 25V, Ceramic.	3198 023 04730	
2002	Cap, 100u, 20%, 50V, Electrolytic.	3198 025 51010	
2003	Cap, 470u, 20%, 16V, Electrolytic.	3198 025 24710	
2004	Cap, 22n, 10%, 50V, Ceramic.	3198 017 02230	
2005	Cap, 330p, 5%, 50V, Ceramic.	3198 016 03310	
2006	Cap, 82p, 5%, 50V, Ceramic	3198 016 08290	
2011	Cap, 10u, 20%, 50V, Electrolytic	3198 025 51090	
2013	Cap, 100n, +80/-20%, 25V, Ceramic.	3198 023 21040	
2102	Cap, 330p, 5%, 50V, Ceramic.	3198 016 03310	
2103	Cap, 330p, 5%, 50V, Ceramic.	3198 016 03310	
2104	Cap, 330p, 5%, 50V, Ceramic.	3198 016 03310	
2201	Cap, 220n, 10%, 50V, Polyester	3198 014 02240	
2202	Cap, 4n7, 10%, 50V, Ceramic.	3198 017 04720	
2203	Cap, 10u, 20%, 50V, Electrolytic	3198 025 51090	
2204	Cap, 100p, 5%, 50V, Ceramic.	3198 016 01010	
2205	Cap, 100n, +80/-20%, 25V, Ceramic.	3198 023 21040	
2206	Cap, 100n, +80/-20%, 25V, Ceramic.	3198 023 21040	
2207	Cap, 100u, 20%, 25V, Electrolytic.	3198 025 31010	
2208	Cap, 100u, 20%, 25V, Electrolytic.	3198 025 31010	
2209	Cap, 470n, +80/-20%, 16V, Ceramic.	3198 017 24740	
2211	Cap, 470n, +80/-20%, 16V, Ceramic.	3198 017 24740	
2212	Cap, 470n, +80/-20%, 16V, Ceramic.	3198 017 24740	
2213	Cap, 470n, +80/-20%, 16V, Ceramic.	3198 017 24740	
2214	Cap, 22n, 10%, 50V, Ceramic.	3198 017 02230	
2215	Cap, 2u2, 20%, 50V, Electrolytic	3198 025 52280	
2216	Cap, 220n, 10%, 16V, Ceramic	2238 780 16654	
2220	Cap, 15p, 5%, 50V, Ceramic	3198 016 01590	
2221	Cap, 1n, 5%, 50V, Ceramic.	3198 016 01020	
2222	Cap, 100n, +80/-20%, 25V, Ceramic.	3198 023 21040	
2226	Cap, 33u, 20%, 25V, Electrolytic	2020 021 90124	
2227	Cap, 1u, 20%, 50V, Electrolytic.	3198 025 51080	
2247	Cap, 47n, 10%, 25V, Ceramic.	3198 023 04730	
2248	Cap, 47n, 10%, 25V, Ceramic.	3198 023 04730	
2249	Cap, 47n, 10%, 25V, Ceramic.	3198 023 04730	
2330	Cap, 100n, 10%, 250V, Metalized Polyester	2222 368 90177	
2340	Cap, 10u, 20%, 250V, Electrolytic.	2020 012 93495	
2341	Cap, 3n3, 10%, 500V, Ceramic	3198 019 43320	
S 2343	Cap, 3n3, 10%, 2KV, Ceramic.	2020 558 90529	
2345	Cap, 1n, 10%, 500V, Ceramic.	3198 019 41020	
2401	Cap, 100n, 10%, 50V, Polyester	3198 014 01040	
2402	Cap, 100n, 10%, 50V, Polyester	3198 014 01040	
2404	Cap, 220n, 10%, 50V, Polyester	3198 014 02240	
2405	Cap, 470p, 5%, 50V, Ceramic.	3198 016 04710	
2407	Cap, 470p, 5%, 50V, Ceramic.	3198 016 04710	
2409	Cap, 220n, 10%, 50V, Polyester	3198 014 02240	
2420	Cap, 4n7, 10%, 50V, Ceramic.	3198 017 04720	
2426	Cap, 100n, 10%, 63V, Metalized Polyeste	2222 370 75104	
2428	Cap, 2n2, 10%, 50V, Ceramic.	3198 017 02220	
2429	Cap, 1u, 20%, 50V, Electrolytic.	3198 025 51080	
2430	Cap, 10u, 20%, 50V, Electrolytic	3198 025 51090	
2431	Cap, 100n, +80/-20%, 25V, Ceramic.	3198 023 21040	
2437	Cap, 100n, +80/-20%, 25V, Ceramic.	3198 023 21040	
2438	Cap, 1u, +80/-20%, 16V, Ceramic.	3198 017 21050	
2440	Cap, 1n, 5%, 50V, Ceramic.	3198 016 01020	
2441	Cap, 1n, 5%, 50V, Ceramic.	3198 016 01020	
2448	Cap, 220p, 10%, 500V, Ceramic.	3198 019 42210	
2450	Cap, 47u, 20%, 160v, Electrolytic.	2020 021 91139	
2451	Cap, 15n, 10%, 50V, Polyester.	2020 300 90575	
2451	0.01uF., 10%, 50V, Polyester, only 27.	3198 138 20941	
2456	Cap, 47n, 10%, 250V, Metalized Polyeste	2222 368 90176	
2457	Cap, 390n, 5%, 250V, Metalized Polypropylene.	2222 479 90021	
2458	Cap, 2u2, 20%, 100V, Electrolytic.	2020 021 91331	
2459	Cap, 680p, 10%, 500V, Ceramic.	3198 019 46810	
2461	Cap, 1n, 10%, 500V, Ceramic.	3198 019 41020	
2462	Cap, 47n, 10%, 250V, Metalized Polyeste	2222 368 90176	
2463	470pF., 10%, 2KV, Ceramic.	4835 122 47638	
S 2465	Cap, 10n, 5%, 1600V, Polypropylene	2222 375 90154	
2469	Cap, 1u, 10%, 50V, Polyester	3198 014 01050	
2473	Cap, 47u, 20%, 50V, Electrolytic	3198 025 54790	
2481	Cap, 470n, 10%, 50V, Polyester	3198 014 04740	
2482	Cap, 68n, 10%, 250V, Polyester	2222 347 90234	
2484	Cap, 100n, 10%, 50V, Polyester	3198 014 01040	
2485	Cap, 4u7, 20%, 250V, Electrolytic.	2020 012 93293	
2486	Cap, 470u, 20%, 16V, Electrolytic.	3198 025 24710	
2487	Cap, 100u, 20%, 50V, Electrolytic.	3198 025 51010	
2488	Cap, 470u, 20%, 16V, Electrolytic.	3198 025 24710	
2489	Cap, 470u, 20%, 16V, Electrolytic.	3198 025 24710	
2490	Cap, 470p, 10%, 500V, Ceramic.	3198 019 44710	
2491	Cap, 470p, 10%, 500V, Ceramic.	3198 019 44710	
2492	Cap, 180p, 5%, 50V, Ceramic.	3198 016 01810	
2500	0.47uF., 250V, Polyester	4835 121 47569	
2502	Cap, 2n2, 10%, 1KV, Ceramic.	3198 019 52220	
2504	Cap, 2n2, 10%, 1KV, Ceramic.	3198 019 52220	
2505	Cap, 2n2, 10%, 1KV, Ceramic.	3198 019 52220	
S 2507	Cap, 1n5, 10%, 1KV, Ceramic.	2020 558 90443	
2508	Cap, 470u, 20%, 200V, Electrolytic	2020 024 90647	
S 2511	Cap, 470p, 10%, 1KV, Ceramic	2020 558 90471	
2517	Cap, 1n, 10%, 50V, Ceramic	3198 019 11020	
S 2518	Cap, 470p, 10%, 1KV, Ceramic	2020 558 90471	
2520	Cap, 82p, 5%, 50V, Ceramic	3198 016 08290	
2521	Cap, 3n3, 10%, 50V, Ceramic.	3198 017 03320	
2522	Cap, 3n3, 10%, 50V, Ceramic.	3198 017 03320	
2524	Cap, 330p, 5%, 50V, Ceramic.	3198 016 03310	
2529	Cap, 100n, +80/-20%, 25V, Ceramic.	3198 023 21040	
2530	Cap, 1u, 20%, 50V, Electrolytic.	2020 021 91147	
2531	Cap, 1n, 2%, 50V, Polypropylene.	2020 310 90049	
2532	Cap, 470p, 5%, 50V, Ceramic.	3198 016 04710	
2533	Cap, 2n2, 10%, 50V, Ceramic.	3198 017 02220	
2540	Cap, 100u, 20%, 25V, Electrolytic.	2020 021 90547	
S 2545	1500pF., 250VAC, Ceramic	4835 122 47621	
S 2550	Cap, 470p, 10%, 1KV, Ceramic	2020 558 90471	
2551	Cap, 47u, 20%, 160v, Electrolytic.	2020 021 91358	
2561	Cap, 1000u, 20%, 16V, Electrolytic	3198 026 21020	
S 2562	Cap, 220p, 10%, 1KV, Ceramic	2020 558 90424	
2564	Cap, 1n, 10%, 50V, Ceramic	3198 017 01020	
2565	Cap, 1n, 10%, 50V, Ceramic	3198 017 01020	
2571	Cap, 2u2, 20%, 25V, Electrolytic	2020 021 91353	
2572	Cap, 330p, 5%, 50V, Ceramic.	3198 016 03310	
2573	Cap, 33n, 10%, 50V, Ceramic.	3198 017 03330	
2575	Cap, 100n, +80/-20%, 25V, Ceramic.	3198 023 21040	
2576	Cap, 6n8, 10%, 50V, Ceramic.	3198 017 06820	
2586	Cap, 220u, 20%, 25V, Electrolytic.	3198 025 32210	
2604	Cap, 22u, 20%, 50V, Electrolytic	3198 025 52290	
2609	Cap, 1n, 5%, 50V, Ceramic.	3198 016 01020	
2613	Cap, 100n, 10%, 50V, Polyester	3198 014 01040	
2615	Cap, 100n, +80/-20%, 25V, Ceramic.	3198 023 21040	
2616	Cap, 22p, 5%, 50V, Ceramic	3198 016 02290	
2617	Cap, 22p, 5%, 50V, Ceramic	3198 016 02290	
2618	Cap, 100p, 5%, 50V, Ceramic.	3198 016 01010	
2619	Cap, 1u, 20%, 50V, Electrolytic.	3198 025 51080	
2620	Cap, 22p, 5%, 50V, Ceramic	3198 016 02290	
2621	Cap, 22p, 5%, 50V, Ceramic	3198 016 02290	
2622	Cap, 220u, 20%, 25V, Electrolytic.	3198 025 32210	
2623	Cap, 10n, 10%, 50V, Ceramic.	3198 017 01030	
2624	Cap, 68p, 5%, 50V, Ceramic	3198 016 06890	
2625	Cap, 390p, 5%, 50V, Ceramic.	3198 016 03910	
2626	Cap, 390p, 5%, 50V, Ceramic.	3198 016 03910	
2627	Cap, 390p, 5%, 50V, Ceramic.	3198 016 03910	
2628	Cap, 390p, 5%, 50V, Ceramic.	3198 016 03910	
2629	Cap, 22n, +80/-20%, 50V, Ceramic	3198 019 22230	
2630	Cap, 100n, +80/-20%, 25V, Ceramic.	3198 023 21040	
2631	Cap, 1u, +80/-20%, 16V, Ceramic.	3198 017 21050	
2633	Cap, 10n, 10%, 50V, Ceramic.	3198 017 01030	
2679	Cap, 100n, +80/-20%, 25V, Ceramic.	3198 023 21040	
2681	Cap, 220u, 20%, 25V, Electrolytic.	3198 025 32210	
2697	Cap, 1n, 5%, 50V, Ceramic.	3198 016 01020	
2843	Cap, 100u, 20%, 25V, Electrolytic.	3198 025 31010	
2851	Cap, 1n, 5%, 50V, Ceramic.	3198 016 01020	
2852	Cap, 1n, 5%, 50V, Ceramic.	3198 016 01020	
2853	Cap, 1n, 5%, 50V, Ceramic.	3198 016 01020	
2854	Cap, 1n, 5%, 50V, Ceramic.	3198 016 01020	
2855	Cap, 3p3, 8%, 50V, Ceramic	3198 016 03380	
2856	Cap, 3p3, 8%, 50V, Ceramic	3198 016 03380	
2857	Cap, 1u, +80/-20%, 16V, Ceramic.	3198 017 21050	
2858	Cap, 47p, 5%, 50V, Ceramic	3198 016 04790	
2860	Cap, 10u, 20%, 50V, Electrolytic	3198 025 51090	
2861	Cap, 100n, +80/-20%, 25V, Ceramic.	3198 023 21040	

S = Safety Part Be sure to use exact replacement part.

2862	Cap, 100n, +80/-20%, 25V, Ceramic. . .	3198 023 21040	
2863	Cap, 10u, 20%, 50V, Electrolytic . . .	3198 025 51090	
2864	Cap, 220n, +80/-20%, 25V, Ceramic. . .	3198 023 22240	
2865	Cap, 220n, +80/-20%, 25V, Ceramic. . .	3198 023 22240	
2866	Cap, 220n, +80/-20%, 25V, Ceramic. . .	3198 023 22240	
2867	Cap, 220n, +80/-20%, 25V, Ceramic. . .	3198 023 22240	
2868	Cap, 4u7, 20%, 50V, Electrolytic . . .	3198 025 54780	
2869	Cap, 100n, +80/-20%, 25V, Ceramic. . .	3198 023 21040	
2870	Cap, 100n, +80/-20%, 25V, Ceramic. . .	3198 023 21040	
2871	Cap, 10u, 20%, 50V, Electrolytic . . .	3198 025 51090	
2874	Cap, 47p, 5%, 50V, Ceramic	3198 016 04790	
2875	Cap, 47p, 5%, 50V, Ceramic	3198 016 04790	
2877	Cap, 100n, +80/-20%, 25V, Ceramic. . .	3198 023 21040	
2882	Cap, 1n, 5%, 50V, Ceramic.	3198 016 01020	
2883	Cap, 10u, 20%, 50V, Electrolytic . . .	3198 025 51090	
2884	Cap, 1n, 5%, 50V, Ceramic.	3198 016 01020	
2888	Cap, 100u, 20%, 25V, Electrolytic. . .	3198 025 31010	
2889	Cap, 100n, +80/-20%, 25V, Ceramic. . .	3198 023 21040	
2950	Cap, 100u, 20%, 25V, Electrolytic. . .	3198 025 31010	
2952	Cap, 1u, +80/-20%, 16V, Ceramic. . . .	3198 017 21050	
2954	Cap, 470n, +80/-20%, 16V, Ceramic. . .	3198 017 24740	
2955	Cap, 10n, 10%, 50V, Ceramic.	3198 017 01030	
2956	Cap, 1u, +80/-20%, 16V, Ceramic. . . .	3198 017 21050	
2958	Cap, 470n, +80/-20%, 16V, Ceramic. . .	3198 017 24740	
2959	Cap, 10n, 10%, 50V, Ceramic.	3198 017 01030	
2960	Cap, 2u2, 20%, 25V, Electrolytic . . .	3198 026 32220	
2961	Cap, 10u, 20%, 16V, Electrolytic . . .	3198 028 21090	
2962	Cap, 10p, 5%, 50V, Ceramic	3198 016 01090	
2963	Cap, 10p, 5%, 50V, Ceramic	3198 016 01090	
3000	Res, 100 ohm, 5%, 1/6W, Carbon Film. .	3198 011 01010	
3001	Res, 100 ohm, 5%, 1/6W, Carbon Film. .	3198 011 01010	
3010	Res, 560 ohm, 5%, 1/6W, Carbon Film. .	3198 011 05610	
3013	Zero ohm,.	4835 111 27056	
3014	4.7k, 5%, 1/10W, Metal Film.	4835 111 27052	
3015	22k, 5%, 1/10W, Metal Film	4835 111 37441	
3016	Res, 680 ohm, 5%, 1/6W, Carbon Film. .	3198 011 06810	
3021	Res, 1K, 2%, 0,25W	4822 051 10102	
3103	Res, 8K2, 5%, 1/6W, Carbon Film. . . .	3198 011 08220	
3104	10k, 5%, 1/10W, Metal Film	4835 111 37216	
3108	Res, 8K2, 5%, 1/6W, Carbon Film. . . .	3198 011 08220	
3109	10k, 5%, 1/10W, Metal Film	4835 111 37216	
3123	75 ohm, 5%, 1/10W, Metal Film.	4835 111 37276	
3200	560 ohm, 5%, 1/10W, Metal Film	4835 111 27054	
3201	390 ohm, 5%, 1/10W, Metal Film	4835 111 37253	
3203	330 ohm, 5%, 1/10W, Metal Film	4835 111 37443	
3204	Res, 1K8, 5%, 1/6W, Carbon Film. . . .	3198 011 01820	
3205	Res, 1K, 2%, 0,25W	4822 051 10102	
3206	560 ohm, 5%, 1/10W, Metal Film	4835 111 27054	
3208	Res, 100 ohm, 5%, 1/6W, Carbon Film. .	3198 011 01010	
3209	22k, 5%, 1/10W, Metal Film	4835 111 37441	
3212	390 ohm, 5%, 1/10W, Metal Film	4835 111 37253	
3213	560 ohm, 5%, 1/10W, Metal Film	4835 111 27054	
3215	22k, 5%, 1/10W, Metal Film	4835 111 37441	
3216	Zero ohm,.	4835 111 27056	
3217	Res, 1M5, 5%, 1/8W, Metalized Glass. .	2322 730 61155	
3218	100 ohm, 5%, 1/10W, Metal Film	4835 111 37432	
3219	560 ohm, 5%, 1/10W, Metal Film	4835 111 27054	
3220	100 ohm, 5%, 1/10W, Metal Film	4835 111 37432	
3225	100k, 5%, 1/10W, Metal Film.	4835 111 37434	
3228	100 ohm, 5%, 1/10W, Metal Film	4835 111 37432	
3231	Zero ohm,.	4835 111 27056	
3232	Zero ohm,.	4835 111 27056	
3233	Zero ohm,.	4835 111 27056	
3243	4.7k, 5%, 1/10W, Metal Film.	4835 111 27052	
3246	82k, 5%, 1/10W, Metal Film	4835 111 37277	
3247	Res, 100 ohm, 5%, 1/6W, Carbon Film. .	3198 011 01010	
3248	Res, 100 ohm, 5%, 1/6W, Carbon Film. .	3198 011 01010	
3249	Res, 330K, 5%, 1/10W, Glass.	3198 021 53340	
3250	Zero ohm,.	4835 111 27056	
3251	100k, 5%, 1/10W, Metal Film.	4835 111 37434	
3252	2.2k, 5%, 1/10W, Metal Film.	4835 111 37234	
3253	2.2k, 5%, 1/10W, Metal Film.	4835 111 37234	
3257	100 ohm, 5%, 1/10W, Metal Film	4835 111 37432	
3258	100 ohm, 5%, 1/10W, Metal Film	4835 111 37432	
3259	100 ohm, 5%, 1/10W, Metal Film	4835 111 37432	
3331	Res, 100 ohm, 5%, 1/6W, Carbon Film. .	3198 011 01010	
3332	Res, 1K, 20%, 1/2W, Carbon Film. . . .	2120 103 90046	
3333	Res, 100 ohm, 5%, 1/6W, Carbon Film. .	3198 011 01010	
3334	Res, 1K, 20%, 1/2W, Carbon Film. . . .	2120 103 90046	
3335	Res, 100 ohm, 5%, 1/6W, Carbon Film. .	3198 011 01010	
3336	Res, 1K, 20%, 1/2W, Carbon Film. . . .	2120 103 90046	
S 3340	Res, 10 ohm, 5%, 1/3W, Metal Film. . .	2306 204 03109	
S 3341	1 ohm, 5%, 1/3W, Metal Film.	4822 111 30483	
S 3342	1 ohm, 5%, 1/3W, Metal Film.	4822 111 30483	
3343	1.5k, 20%, 1/2W, Carbon Composition. .	4835 110 47034	
3344	Res, 22 ohm, 5%, 1/6W, Carbon Film . .	3198 011 02290	
S 3345	VDR, DC, 1mA, 50V, MAX 115V	2322 593 13507	
3346	Res, 22 ohm, 5%, 1/6W, Carbon Film . .	3198 011 02290	
3401	3.3 ohm, 5%, 1/4W, Carbon Film	3198 011 03380	
3402	3.3 ohm, 5%, 1/4W, Carbon Film	3198 011 03380	
3403	3.3 ohm, 5%, 1/4W, Carbon Film	3198 011 03380	
3405	Res, 2K, 1%, 3/5W, Metal Film.	2322 156 22002	
3406	Res, 1K, 5%, 1/6W, Carbon Film	3198 011 01020	
3407	Res, 2K, 1%, 3/5W, Metal Film.	2322 156 22002	
3408	Res, 1K, 5%, 1/6W, Carbon Film	3198 011 01020	
3409	1.5 ohm, 5%, 1/3W, Metal Film.	4835 116 57664	
3410	Res, 220 ohm, 5%, 1/6W, Carbon Film. .	3198 011 02210	
3411	Res, 220 ohm, 5%, 1/6W, Carbon Film. .	3198 011 02210	
3420	470k, 5%, 1/10W, Metal Film.	4835 111 37407	
3421	Res, 2K2, 5%, 1/6W, Carbon Film. . . .	3198 011 02220	
3422	Res, 2K2, 5%, 1/6W, Carbon Film. . . .	3198 011 02220	
3423	Res, 680K, 5%, 1/10W, Metalized Glass.	3198 021 56840	
3424	Res, 10M, 10%, 1/10W, Metalized Glass.	2120 108 90606	
3425	150k, 5%, 1/10W, Metal Film.	4835 111 27045	
3426	39k, 5%, 1/10W, Metal Film	4835 111 27051	
3428	22k, 5%, 1/10W, Metal Film	4835 111 37441	
3429	27k, 5%, 1/10W, Metal Film	4835 111 37442	
3431	3.3k, 5%, 1/10W, Metal Film.	4835 111 37247	
3432	100 ohm, 5%, 1/10W, Metal Film	4835 111 37432	
3436	Res, 1K, 2%, 0,25W	4822 051 10102	
3437	10k, 5%, 1/10W, Metal Film	4835 111 37216	
3438	33k, 1/4W, Carbon Film	4835 110 57375	
3442	Res, 3K9, 5%, 1/6W, Carbon Film. . . .	3198 011 03920	
3447	10k, 5%, 1/10W, Metal Film	4835 111 37216	
3448	Res, 8K2, 5%, 1/6W, Carbon Film. . . .	3198 011 08220	
3449	Res, 3K3, 5%, 1/6W, Carbon Film. . . .	3198 011 03320	
S 3452	Res, 22 ohm, 5%, 2 1/2W, Metal Film. .	2322 195 63229	
S 3453	Res, 4R7, 5%, 5W, Wire Wound	2322 251 41478	
S 3454	Res, 33K, 5%, 1 1/3W, Metal Film . . .	2322 194 63333	
3458	Res, 1K, 5%, 1/6W, Carbon Film	3198 011 01020	
3461	Res, 4K7, 5%, 1/6W, Carbon Film. . . .	3198 011 04720	
S 3462	Res, 6K8, 5%, 5W, Metal Film	2322 257 41682	
3463	Res, 47 ohm, 5%, 1/6W, Carbon Film . .	3198 011 04790	
3464	Res, 1K, 2%, 0,25W	4822 051 10102	
S 3465	Res, 10 ohm, 5%, 1/3W, Metal Film. . .	2306 204 03109	
3466	Res, 39K, 1%, 3/5W, Metal Film	2322 156 23903	
3467	Res, 14K, 1%, 3/5W, Metal Film	2322 156 21403	
3467	Res, 15K, 1%, 3/5W, Metal Film	2322 156 21503	
3468	Res, 1K, 5%, 1/6W, Carbon Film	3198 011 01020	
3469	3.3k, 5%, 1/10W, Metal Film.	4835 111 37247	
3478	Res, 220K, 5%, 1/6W, Carbon Film . . .	3198 011 02240	
3480	Res, 27K, 1%, 3/5W, Metal Film	2322 156 22703	
3481	Res, 100K, 1%, 3/5W, Metal Film. . . .	2322 156 21004	
3482	Res, 32K4, 1%, 3/5W, Metal Film. . . .	2322 156 23243	
3483	Res, 22K, 5%, 1/6W, Carbon Film. . . .	3198 011 02230	
3484	Res, 10K, 5%, 1/6W, Carbon Film. . . .	3198 011 01030	
S 3485	4.7 ohm, 5%, 1/2W, Metal Film.	4835 110 47023	
S 3486	1 ohm, 5%, 1/2W, Metal Film.	4835 110 27012	
S 3487	1 ohm, 5%, 1/2W, Metal Film.	4835 110 27012	
S 3488	4.7 ohm, 5%, 1/2W, Metal Film.	4835 110 47023	
S 3490	1 ohm, 5%, 1/2W, Metal Film.	4835 110 27012	
S 3491	1 ohm, 5%, 1/2W, Metal Film.	4835 110 27012	
S 3492	1 ohm, 5%, 1/2W, Metal Film.	4835 110 27012	
3495	6.8k, 5%, 1/10W, Metal Film.	4835 111 37272	
3496	10k, 5%, 1/10W, Metal Film	4835 111 37216	
3497	10k, 5%, 1/10W, Metal Film	4835 111 37216	
3501	Res, 470 ohm, 20%, 1/2W, Carbon Film .	2120 103 90019	
S 3502	Res, 2M2, 5%, 1/2W, Metalized Glass. .	2322 242 13225	
3503	10ohm, 120VAC, Positive Temperature Coefficient	4835 116 47001	
S 3505	Surge Protector.	2422 549 43073	
S 3508	Res, 22K, 5%, 2 1/2W, Metal Film . . .	2322 195 63223	
S 3510	Res, 33K, 5%, 2 1/2W, Metal Film . . .	2322 195 63333	
S 3511	Res, 1K, 10%, 7W, Metal Film	2322 258 41102	
3512	15k, 5%, 1/10W, Metal Film	4835 111 37458	
3513	Res, 180K, 5%, 1/4W, Carbon Film . . .	2120 101 74184	
3514	Res, 820K, 1%, 3/5W, Metal Film. . . .	2322 156 28204	
S 3515	2.5 ohm, 20%, 3.6W, Negative Temperature Coefficient.	2122 612 00023	
3516	Res, 1K, 2%, 0,25W	4822 051 10102	
3517	Res, 1K, 5%, 1/6W, Carbon Film	3198 011 01020	
S 3518	Res, 0R22, 5%, 3W, Metal Film.	2120 106 90548	
3520	Res, 82K, 5%, 1/6W, Carbon Film. . . .	3198 011 08230	
3521	330 ohm, 5%, 1/10W, Metal Film	4835 111 37443	
S 3525	33 ohm, 5%, 1/3W, Metal Film	4835 116 57665	
3528	Res, 100 ohm, 5%, 1/6W, Carbon Film. .	3198 011 01010	
3529	Res, 68 ohm, 5%, 1/6W, Carbon Film . .	3198 011 06890	
3530	Res, 3K3, 5%, 1/6W, Carbon Film. . . .	3198 011 03320	
3532	Res, 6K8, 5%, 1/6W, Carbon Film. . . .	3198 011 06820	
3534	15k, 5%, 1/10W, Metal Film	4835 111 37458	
3536	Res, 18K, 5%, 1/6W, Carbon Film. . . .	3198 011 01830	
3537	Res, 10K, 5%, 1/6W, Carbon Film. . . .	3198 011 01030	
S 3542	4.7 Megohm, 5%, 1/2W, Metal Film . . .	4835 116 57009	
3570	15k, 5%, 1/10W, Metal Film	4835 111 37458	
3571	Res, 150K, 1%, 3/5W, Metal Film. . . .	2322 156 21504	
3573	Res, 2K, 1%, 1/10W, Metalized Glass. .	2120 108 92657	
3574	33k, 5%, 1/10W, Metal Film	4835 111 37248	
3575	Res, 100 ohm, 5%, 1/6W, Carbon Film. .	3198 011 01010	
3577	Res, 10K, 5%, 1/6W, Carbon Film. . . .	3198 011 01030	
3578	Res, 1K, 2%, 0,25W	4822 051 10102	
3579	Res, 1K, 1%, 1/10W, Metalized Glass. .	2120 108 91451	
3585	Res, 100 ohm, 5%, 1/6W, Carbon Film. .	3198 011 01010	
3592	10k, 5%, 1/10W, Metal Film	4835 111 37216	
3594	22k, 5%, 1/10W, Metal Film	4835 111 37441	

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3595	68k, 5%, 1/6W, Carbon Film	4835 111 37205	
3596	Res, 10K, 5%, 1/6W, Carbon Film.	3198 011 01030	
3597	100 ohm, 5%, 1/10W, Metal Film	4835 111 37432	
3598	10k, 5%, 1/10W, Metal Film	4835 111 37216	
3599	22k, 5%, 1/10W, Metal Film	4835 111 37441	
3607	8.2k, 5%, 1/8W, Inline Package	4835 111 97046	
3608	2.2k, 5%, 1/8W, Inline Package	4835 111 97049	
3609	2.2k, 5%, Resistor Network	2120 108 93868	
3611	Res, 1K, 2%, 0,25W	4822 051 10102	
3612	10k, 5%, 1/10W, Metal Film	4835 111 37216	
3613	10k, 5%, 1/10W, Metal Film	4835 111 37216	
3615	10k, 5%, 1/10W, Metal Film	4835 111 37216	
3617	8.2k, 5%, 1/10W, Metal Film.	4835 111 37448	
3618	Res, 100 ohm, 5%, 1/6W, Carbon Film.	3198 011 01010	
3619	4.7k, 5%, 1/10W, Metal Film.	4835 111 27052	
3629	470 ohm, 5%, 1/10W, Metal Film	4835 111 37259	
3630	Res, 470 ohm, 5%, 1/6W, Carbon Film.	3198 011 04710	
3631	27k, 5%, 1/10W, Metal Film	4835 111 37442	
S 3632	Res, 47 ohm, 5%, 2 1/2W, Metal Film.	2322 195 63479	
3633	Res, 820 ohm, 5%, 1/6W, Carbon Film.	3198 011 08210	
3634	2.2k, 5%, 1/10W, Metal Film.	4835 111 37234	
3635	22k, 5%, 1/10W, Metal Film	4835 111 37441	
3636	22k, 5%, 1/10W, Metal Film	4835 111 37441	
3637	2.2k, 5%, 1/10W, Metal Film.	4835 111 37234	
3651	Res, 100 ohm, 5%, 1/6W, Carbon Film.	3198 011 01010	
3652	Res, 100 ohm, 5%, 1/6W, Carbon Film.	3198 011 01010	
3653	Res, 10K, 5%, 1/6W, Carbon Film.	3198 011 01030	
3654	100 ohm, 5%, 1/10W, Metal Film	4835 111 37432	
3655	100 ohm, 5%, 1/10W, Metal Film	4835 111 37432	
3657	Res, 270 ohm, 5%, 1/6W, Carbon Film.	3198 011 02710	
3661	Res, 100 ohm, 5%, 1/6W, Carbon Film.	3198 011 01010	
3662	4.7k, 5%, 1/10W, Metal Film.	4835 111 27052	
3663	8.2k, 5%, 1/10W, Metal Film.	4835 111 37448	
3664	8.2k, 5%, 1/10W, Metal Film.	4835 111 37448	
3665	4.7k, 5%, 1/10W, Metal Film.	4835 111 27052	
3666	5.6k, 5%, 1/10W, Metal Film.	4835 111 37376	
3667	27k, 5%, 1/10W, Metal Film	4835 111 37442	
3672	4.7k, 5%, 1/10W, Metal Film.	4835 111 27052	
3673	10k, 5%, 1/10W, Metal Film	4835 111 37216	
3674	1.8k, 5%, 1/10W, Metal Film.	4835 111 37231	
3675	Res, 150 ohm, 5%, 1/10W, Metalized Glas	3198 021 51510	
3676	Res, 150 ohm, 5%, 1/10W, Metalized Glas	3198 021 51510	
3677	Res, 150 ohm, 5%, 1/10W, Metalized Glas	3198 021 51510	
3680	680 ohm, 5%, 1/10W, Metal Film	4835 111 37271	
3681	4.7k, 5%, 1/10W, Metal Film.	4835 111 27052	
3682	8.2k, 5%, 1/10W, Metal Film.	4835 111 37448	
3683	100 ohm, 5%, 1/10W, Metal Film	4835 111 37432	
3684	3.3k, 5%, 1/10W, Metal Film.	4835 111 37247	
3841	Res, 100 ohm, 5%, 1/6W, Carbon Film.	3198 011 01010	
3842	Res, 100 ohm, 5%, 1/6W, Carbon Film.	3198 011 01010	
3843	47k, 5%, 1/10W, Metal Film	4835 111 37445	
3844	470 ohm, 5%, 1/10W, Metal Film	4835 111 37259	
3845	470 ohm, 5%, 1/10W, Metal Film	4835 111 37259	
3950	Res, 680 ohm, 5%, 1/6W, Carbon Film.	3198 011 06810	
3951	3.3k, 5%, 1/10W, Metal Film.	4835 111 37247	
3952	Res, 100 ohm, 5%, 1/6W, Carbon Film.	3198 011 01010	
3953	6.8k, 5%, 1/10W, Metal Film.	4835 111 37272	
3954	1.5k, 5%, 1/10W, Metal Film.	4835 111 37437	
3955	Res, 4K7, 5%, 1/6W, Carbon Film.	3198 011 04720	
3956	1.5k, 5%, 1/10W, Metal Film.	4835 111 37437	
3957	Res, 4K7, 5%, 1/6W, Carbon Film.	3198 011 04720	
4001	Zero ohm,	4835 111 27056	
4002	Zero ohm,	4835 111 27056	
4004	Zero ohm,	4835 111 27056	
4007	Zero ohm,	4835 111 27056	
4009	Zero ohm,	4835 111 27056	
4010	Zero ohm,	4835 111 27056	
4011	Zero ohm,	4835 111 27056	
4012	Zero ohm,	4835 111 27056	
4013	Zero ohm,	4835 111 27056	
4020	Zero ohm,	4835 111 27056	
4051	Zero ohm,	4835 111 27056	
4100	Zero ohm,	4835 111 27056	
4101	Zero ohm,	4835 111 27056	
4102	Zero ohm,	4835 111 27056	
4103	Zero ohm,	4835 111 27056	
4143	Zero ohm,	4835 111 27056	
4144	Zero ohm,	4835 111 27056	
4203	Zero ohm,	4835 111 27056	
4207	Zero ohm,	4835 111 27056	
4212	Zero ohm,	4835 111 27056	
4214	Zero ohm,	4835 111 27056	
4215	Zero ohm,	4835 111 27056	
4216	Zero ohm,	4835 111 27056	
4501	Zero ohm,	4835 111 27056	
4602	Zero ohm,	4835 111 27056	
4650	Zero ohm,	4835 111 27056	
4651	Zero ohm,	4835 111 27056	
4652	Zero ohm,	4835 111 27056	
4654	Zero ohm,	4835 111 27056	
4655	Zero ohm,	4835 111 27056	
4684	Zero ohm,	4835 111 27056	
4687	Zero ohm,	4835 111 27056	
4831	Zero ohm,	4835 111 27056	
4832	Zero ohm,	4835 111 27056	
4833	Zero ohm,	4835 111 27056	
4902	Zero ohm,	4835 111 27056	
4903	Zero ohm,	4835 111 27056	
4904	Zero ohm,	4835 111 27056	
4905	Zero ohm,	4835 111 27056	
4909	Zero ohm,	4835 111 27056	
4911	Zero ohm,	4835 111 27056	
4912	Zero ohm,	4835 111 27056	
4914	Zero ohm,	4835 111 27056	
4957	Zero ohm,	4835 111 27056	
4999	Zero ohm,	4835 111 27056	
5000	Coil, 5u6.	3198 018 25680	
5004	Coil, 820n	2422 535 97314	
5201	Coil, 22u.	3198 018 22290	
5202	Coil, 6u8.	3198 018 16880	
5342	22uH., 10%, Coil, Peaking.	4835 157 67069	
S 5445	Transformer, L.O.T., models ending in C 101, C121, and C125.	2422 531 02327	
S 5445	Transformer, L.O.T., models ending in C 221 and C225	3128 138 20941	
5451	Coil, 27u.	2422 535 96614	
5457	Coil, Linear Correction.	3128 138 53241	
5461	Transformer.	3128 138 33811	
5480	Coil, 27u.	2422 535 97334	
5480	Coil, 39u.	2422 535 97336	
5480	33uH., Peaking Coil, only in 25.	4835 157 58205	
S 5500	Filter, Mains, 5mH, 2A	2422 549 43432	
5516	100uH., Coil	4835 157 67078	
5518	Fixed, Inductor, 100MHz, 50R.	3198 018 90010	
5521	Coil, 2u2.	3198 018 12280	
5540	Coil, 4u7.	3198 018 14780	
S 5545	Transfomer,	2422 531 02314	
5551	27uH., 5%, Coil, Peaking	4835 157 67052	
5552	Fixed, Inductor, 100MHz, 50R.	3198 018 90010	
5572	100uH., Coil	4835 157 67078	
5573	100uH., Coil	4835 157 67078	
5575	100uH., Coil	4835 157 67078	
5576	100uH., Coil	4835 157 67078	
5577	Fixed, Inductor, 100MHz, 50R.	3198 018 90010	
5600	Coil, 8u2.	3198 018 18280	
5601	Coil, 8u2.	3198 018 18280	
5620	Coil, 6u8.	3198 018 16880	
5821	Coil, 100u	3198 018 21010	
5831	Coil, 12u.	3198 018 21290	
5832	Coil, 12u.	3198 018 21290	
6008	Zener, 33 Volt BZX79-C33	4835 130 37904	
6113	Zener Diode, 6.8 volt.	9340 386 40115	
6211	Diode, 1N4148.	4835 130 37048	
6212	Diode, 1N4148.	4835 130 37048	
6213	Diode, 1N4148.	4835 130 37048	
6331	Diode.	4835 130 37294	
6333	Diode.	4835 130 37294	
6335	Diode.	4835 130 37294	
6401	Diode.	4835 130 37094	
6402	Zener, 33 Volt, BZX79-C33.	4835 130 37904	
6403	Diode.	4835 130 37094	
6404	Diode.	4835 130 37094	
6449	Diode, 1N4148.	4835 130 37048	
6450	Diode, 1N4148.	4835 130 37048	
6460	Diode, Rect, BY228/20	9336 215 80112	
6463	Diode, 1N4148.	4835 130 37048	
6465	Diode, BYD33J.	4835 130 37094	
6466	Diode, BYD33J.	4835 130 37094	
6480	Diode, Zener	4835 130 37947	
6481	Diode, 1N4148.	4835 130 37048	
6485	Diode, BYD33J.	4835 130 37094	
6486	Diode, EGP20DL-530	4835 130 37919	
6487	Diode.	4835 130 37094	
6488	Diode, Rect, BYV27-200.	9322 126 72673	
6490	Diode, Rect, BYV27-200.	9322 126 72673	
6505	Diode, Bridge Rect, GBU6JL-7002	9322 138 08667	
6507	Diode, BYD33J.	4835 130 37094	
6508	Diode, BYD33J.	4835 130 37094	
6510	Zener Diode, 20 volt	9331 178 60133	
6511	Diode, BYV95C.	4835 130 37052	
6512	Diode, Rect, BY228/20	4822 130 41275	
6513	Diode, Rect, BY228/20	4822 130 41275	
6514	Zener, 18 Volt, BZX79-C18.	4835 130 37908	
6540	Diode.	4835 130 37294	
6550	Diode, Rect, BY229X-800	9340 380 30127	
6560	Diode, EGP20DL-530	4835 130 37919	
6570	Diode, EGP20DL-530	4835 130 37919	
6582	Diode, EGP20DL-530	4835 130 37919	
6584	Diode, 1N4148.	4835 130 37048	
6585	Diode, 1N4148.	4835 130 37048	
6590	Diode, EGP20DL-530	4835 130 37919	
6591	Diode, BAS216.	4835 130 37905	
6601	Diode, Zener	4835 130 37684	
6606	Zener, 4.7 Volt, BZX79-C4V7.	4835 130 37005	

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6607	Zener, 6.8 Volt, BZX79-C6V8.	4835 130 37945
6690	LED, LTL-307P.	4835 130 97096
6831	Diode, BAS216.	4835 130 37905
6951	Diode, BAS216.	4835 130 37905
6961	Diode, BAS216.	4835 130 37905
7250	IC,.	9352 620 26112
7251	IC, LM317T	9337 220 80682
7254	Transistor, NPN, BC847B.	4822 130 60511
7256	Transistor, NPN, BC847B.	4822 130 60511
7258	Transistor, NPN, BC847B.	4822 130 60511
7263	Transistor, PNP, BC857B.	5322 130 60508
7266	Transistor, NPN, BC847B.	4822 130 60511
7330	IC,.	9352 184 10112
7401	IC,.	9322 121 47687
7460	Transistor, NPN, BU1508DX.	9340 170 50127
7461	Transistor, NPN, BF819	9335 354 50127
7462	Transistor, BC547B	4835 130 47055
7463	Transistor, BC557B	4835 130 47409
7480	IC,.	9322 028 93682
7481	Transistor, BC557B	4835 130 47409
7482	Transistor, PNP, BC857B.	5322 130 60508
7518	STH8NA60FI SMPS FET	9322 068 92687
7518	STH10NC60FI SMPS FET.	9322 155 66687
7520	IC, MC44603A	4835 209 88537
7570	IC,.	9337 711 00676
S 7581	Coupler, TCDT1101G	9338 431 30682
7590	Transistor, NPN, BC847B.	4822 130 60511
7591	Transistor, NPN, BC847B.	4822 130 60511
7592	Transistor, NPN, BC847B.	4822 130 60511
7600	IC, SAA5543PS/M4/1046 L90US1-1.4 . . .	4835 310 57477
7601	IC, ST24W04B6.	9322 097 23682
7603	Transistor, NPN, BC337	9331 796 00126
7604	Transistor, NPN, BC847B.	4822 130 60511
7605	Transistor, NPN, BC847B.	4822 130 60511
7608	Transistor, NPN, BC847B.	4822 130 60511
7609	Transistor, NPN, BC847B.	4822 130 60511
7680	IR Receiver.	9322 127 53667
7833	IC,.	9322 135 49682
7950	IC,.	4835 209 88543
9423	Res, 10K, 5%, 1/6W, Carbon Film. . . .	3198 011 01030
CBA	00EMF820A002 Main Chassis Board Asm. .	00EM F82 0A002

Cabinet & Accessory Parts

	Cabinet & Accessory Parts	
S AC01	Power Cord	3135 010 04731
S AC02	Anode Clip	4835 256 97264
AC03	Cabinet Back	3139 124 27731
AC04	Cabinet Front.	3139 137 52851
AC05	Chassis Guide.	3139 124 31381
AC06	Control Buttons.	3139 124 27351
S AC07	Convergence and Purity Assembly. . . .	2422 549 43385
S AC08	CRT A63AFW86X (26LL59 1121).	9301 734 20443
S AC08	CRT A63AFW36X (C121 Version)	9301 763 20443
S AC09	Coil, Degaussing	3121 218 62961
S AC09	Coil, Degaussing	3121 218 62971
AC11	Light Guide.	3139 124 26461
AC12	Nameplate.	4835 459 17546
AC13	Owner's Manual, English & Spanish (26LL 59 0121)	3135 015 10711
AC13	Owner's Manual, Spanish (26LL59 1121).	3135 015 10721
AC14	Power Button	3139 124 26444
REMOTE	Remote Transmitter, RC282901/01. . . .	3139 228 81441
AC16	Speaker, 5W, 16 ohm (2 Used)	2422 264 00333
S AC18	Yoke	3313 203 00121
AC19	Yoke Wedge (3 Used).	4835 535 27001
S AC20	AC Adapt, UL - IEC (26LL59 1121) . . .	3135 010 03071
AC21	Battery, 1.5V AA, 2-Pack, (Not Shown .	9299 000 10137
AC24	Spring	3139 121 26231